Load Cell Tester

For the simultaneous monitoring of 4 load cells in weighing systems
Calibrator and mV generator for instrumentation

USER MANUAL

Firmware: PMT401
Release nr.: 1.2

CONTENTS

INSTRUMENT'S FEATURES

TECHNICAL SPECIFICATIONS Page 3
POWER SUPPLY AND BATTERY REPLACEMENT Page 4
MAIN PERFORMANCES Page 5
SWITCHING BETWEEN LOAD CELL TESTER AND CALIBRATOR MODES Page 6

CONNECTIONS

CONNECTION TO THE LOAD CELLS with Cable "A" Page 7
CONNECTION TO THE LOAD CELLS with Cable "B" Page 8
USING THE LOAD CELL TESTER IN "CALIBRATOR" MODE WITH J1/PT BOARD Page 9
USING THE LOAD CELL TESTER IN "CALIBRATOR" MODE WITH J2/CB BOARD Page 9
CGS4/C and CEM4/C SUMMING JUNCTION BOXES Page 10

THE USE OF THE INSTRUMENT

KEY FUNCTIONS IN OPERATING MODE Page 11
KEY FUNCTIONS WITHIN THE VARIOUS MENUS Page 12
POWER-ON SEQUENCE Page 13
OPERATING MODE : DATA VISUALIZATION Page 14
"WEIGHING PARAMETERS" MENU Page 15
ADDITIONAL FUNCTIONS Page 18
DISPLAY INTENSITY ADJUSTMENT Page 20
THE "CALIBRATOR" FUNCTION Page 21
ACCESSORIES, OPTIONS AND SPARE PARTS Page 23

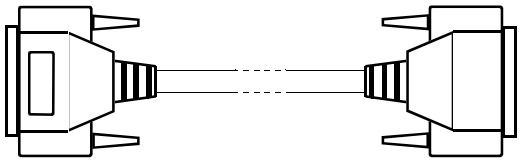
APPENDIX A

CONFIGURATION FILES MANAGEMENT Page 25
ACCESSING THE CONFIGURATION FILES MENU Page 26
SAVING A FILE Page 27
OPENING A FILE Page 30
DELETING ONE FILE / ALL FILES Page 32
TRANSFERRING ONE FILE / ALL FILES Page 35
STORING THE mV/V LOAD CELLS SIGNALS Page 38
STORED mV/V LOAD CELLS SIGNALS VISUALISATION Page 40
GENERATING THE STORED mV/V LOAD CELLS SIGNALS Page 41

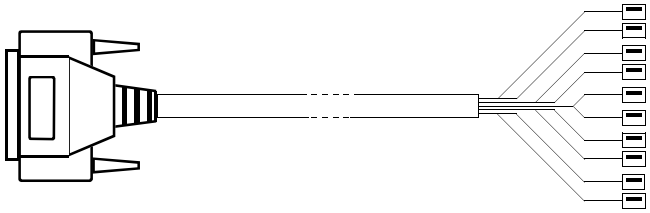
TECHNICAL SPECIFICATIONS

Instrument power supply	4 x 1.5 V alkaline disposable batteries -AA size- or: 4 x 1.2 V Ni-MH rechargeable batteries -AA size-
Current consumption	Min. 125 mA - Max. 190 mA
Battery life	About 4 hours with disposable batteries About 8 hours with Ni-MH batteries (2000 mAh)
Operating temperature	+ 14°F to + 122°F (-10°C to +50°C)
Storage temperature	- 4°F to + 158°F (-20°C to +70°C)
Display	Graphic, 3"
Keyboard	16 keys + On / Off switch
Overall dimensions	8.66 x 4.60 x 2.00 in. (220 x 117 x 51 mm.) H x W x D
Weight	Approximately 1.1 lbs. (500 Grams)
Enclosure	Polyamide (UL94 - V2)
Protection degree (front)	IP 54
Connection to load cells With Cable **A** (std) or Cable **B** (option)	**"A" type:** 6 foot (2 m) cable with 25 pin Sub-D connectors **"B" type:** 10 foot (3 m) cable with spring terminal connectors
Load cells excitation voltage	5 Vdc @ 60 mA (4 x 350 Ω load cells) max.
4 individual load cell channels with the following specs:	
Linearity	< 0.01% of Full Scale
Internal resolution	24 bit
Displayed weight resolution	Up to 50.000 counts
Input signal range	-3.9 mV/V to +3.9 mV/V
Decimal digits	Up to 3
Accuracy of the mV/V signal generated in Calibrator mode	0.033% of Full Scale (1/3000)
LC's excitation voltage input range	Min: 3 Vdc Max: 15 Vdc
mV signal output range	Min: -3.0 mV Max: +20.3 mV
Load cells impedance	350/700 Ω selection, or min. 300 to max. 2000 Ω setting.

Standard "A" type cable with 25 pin Sub-D connectors

LC Tester side  Load cell connections

Optional "B" type cable with spring terminal connectors

LC Tester side  Load cell connections

POWER SUPPLY AND BATTERIES REPLACEMENT

The Load Cell Tester is powered by **"AA" size batteries :**

Use four x 1.5 V Alkaline Disposable Batteries or 1.2 V Ni-MH Rechargeable Batteries

The battery life depends on the number of load cells being powered and the intensity level of the LCD display.

Min. consumption is about **125 mA** (single 350 Ω load cell with display intensity at intermediate level).

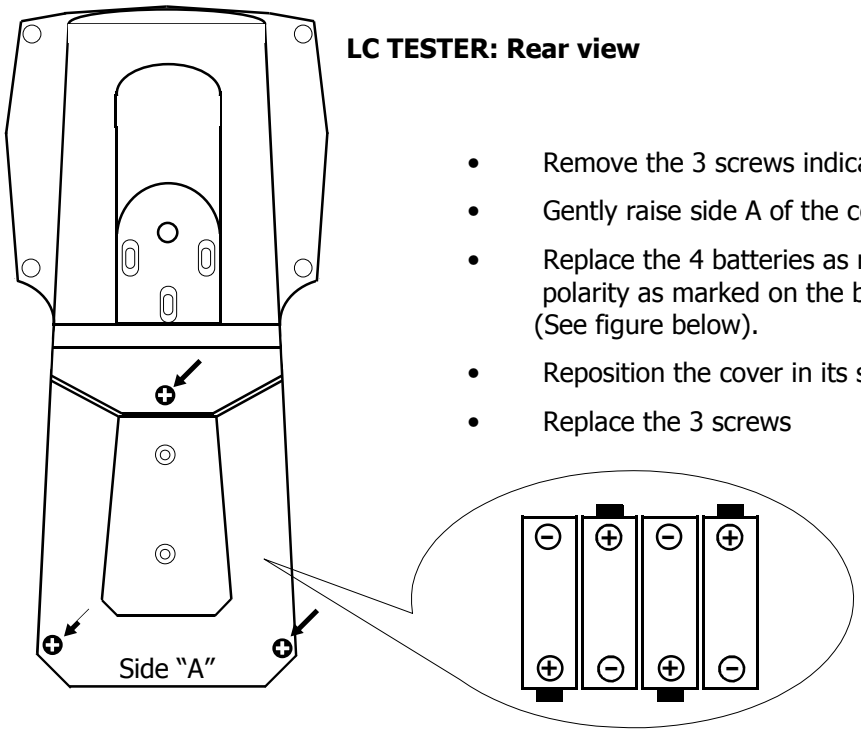
Max. consumption is about **190 mA** (four 350 Ω load cells with display intensity at maximum level).

The life of alkaline disposable batteries is about **4 hours** in continuous operating mode*****, at the max. consumption.

The life of the Ni-MH rechargeable batteries depends on their capacity (expressed in mA per hour). For example, with 4 x 2000 mAh batteries, the battery life is over **8 hours** in continuous operating mode*****, at the max. consumption (2000 mAh/190 mA = 10,5 h).
Even though the theoretical limit exceeds 10 hours, the auto shut-off takes place sooner in order to assure the full functionality of the Load Cell Tester and to avoid completely discharging the batteries.

***** By "continuous operating mode" we mean that the Load Cell Tester switched-on continuously.
Setting the "auto shut-off" parameter will extend the battery life (see page 16 for additional information).

BATTERY REPLACEMENT



LC TESTER: Rear view

- Remove the 3 screws indicated by the arrows
- Gently raise side A of the cover and slide it out.
- Replace the 4 batteries as required, observing polarity as marked on the battery holder (See figure below).
- Reposition the cover in its seat
- Replace the 3 screws

The manufacturer waives all responsibility for any damage to the Load Cell Tester caused by the use of batteries other than those listed above.

MAIN PERFORMANCES

Even if the **2 main functions** performed by the Load Cell Tester are independent, they allow to carry out the complete analysis of any weighing system composed by load cells (up to 4) and weight indicator.

Function for testing the load cells

This mode is used to diagnosis the load cells.

The display shows the following group of parameters:

1. The signals coming from the load cells (mV/V values)
2. The distribution of the weight on the load cells (% values)
3. Load on each load cell compared with its nominal capacity (% values)
4. Weight value on each load cell (expressed in the selected measurement unit: g, kg, Ton, lb, N, kN)

Values 3 and 4 are only displayed if the parameters described on pages 15 to 17 have been programmed.

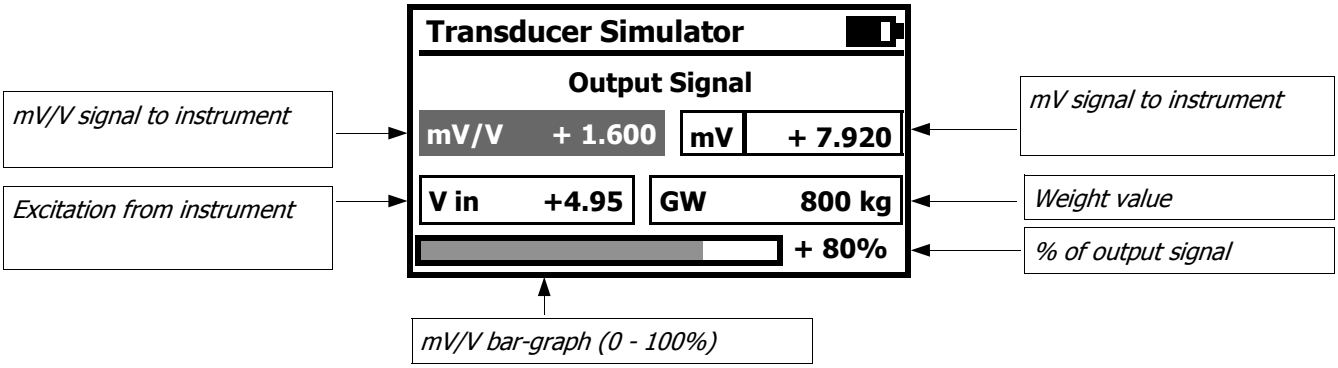
Faulty load cells or bad connections*, zero offset drifts or unstable signals can be easily detected.

* These messages appear on the display in the following conditions:
1. "EXC +" indicates a problem with the + Excitation lead
2. "EXC -" indicates a problem with the - Excitation lead
3. "SIGNAL" indicates a problem with one of the Signal leads

Transducer Simulator / Calibrator Mode

In this mode the load cell tester is used to calibrate or check out the weight indicator.
A signal of up to 20 mV can be generated and used to check the linearity and to check or calibrate the Zero and Span of any weighing instrument.

Displayed parameters:

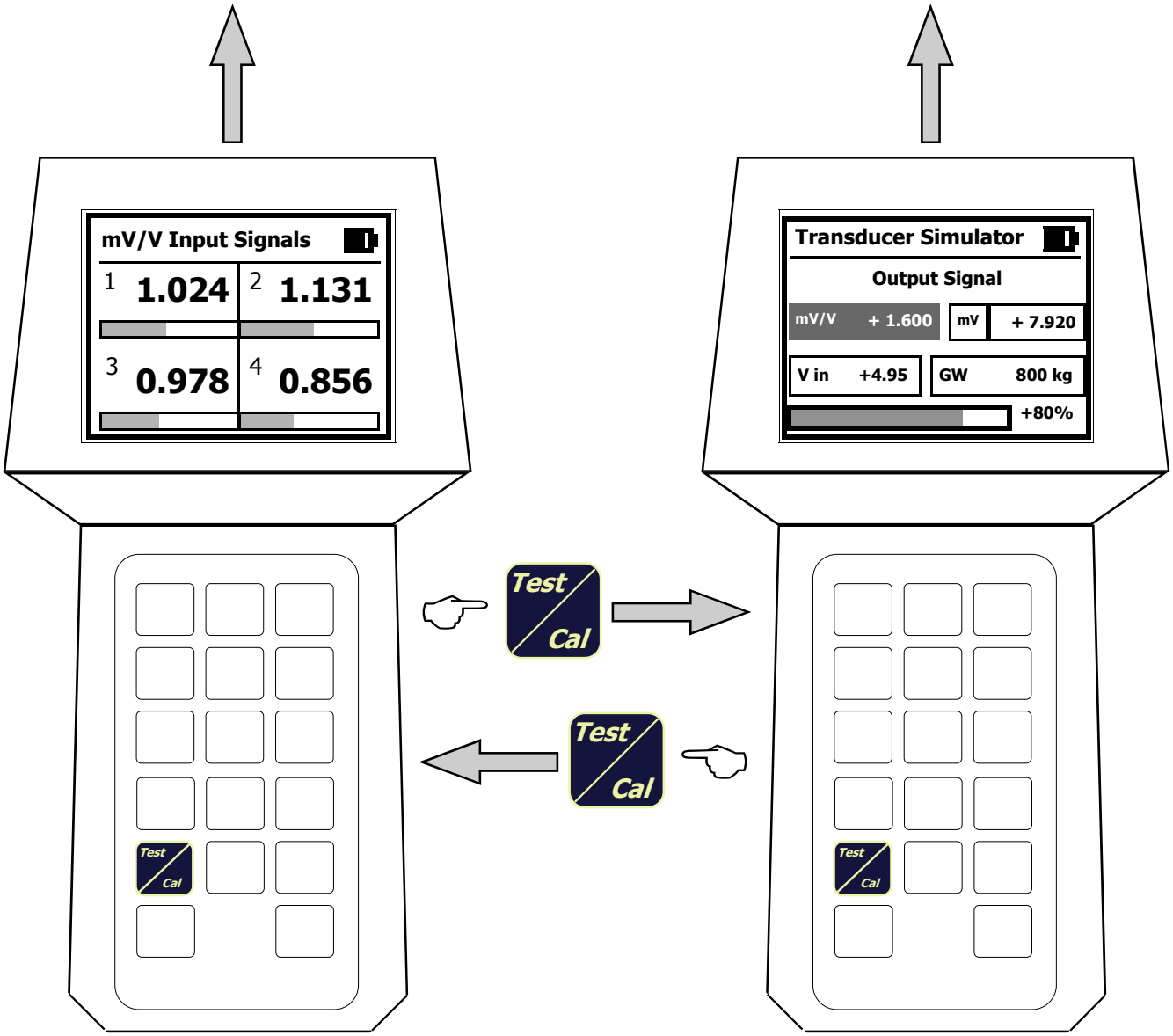


SWITCHING BETWEEN "LOAD CELL TESTER" AND "CALIBRATOR" MODES

Switching between the 2 functions (as described on the previous page) is performed by pressing the **Test/Cal** key:

Function
LOAD CELL TESTER
To be used **exclusively** for testing the load cells
Operating mode described on page 14

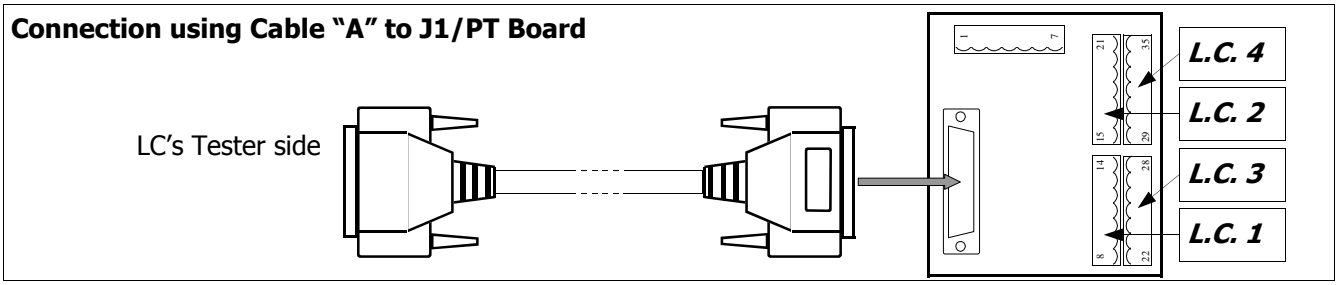
Function
CALIBRATOR/SIMULATOR
To be used **exclusively** for testing and calibrating the weighing instru-ment.
Oper. mode described on page 21, 22



CONNECTION TO THE LOAD CELLS with Cable "A"

Cable "A", terminates with a 25 pin female Sub-D connector and is supplied with the J1/PT Screw Terminal Board.

Connection using Cable "A" to J1/PT Board



The LC's cables must be disconnected from their terminals and connected to the J1/PT screw terminals.

LOAD CELLS CONNECTION TO J1/PT SCREW TERMINAL BOARD - TERMINALS #:

LOAD CELL 1	
8	SHIELD
9	- EXCITATION
10	+ EXCITATION
11	+ SENSE
12	- SENSE
13	- SIGNAL
14	+ SIGNAL

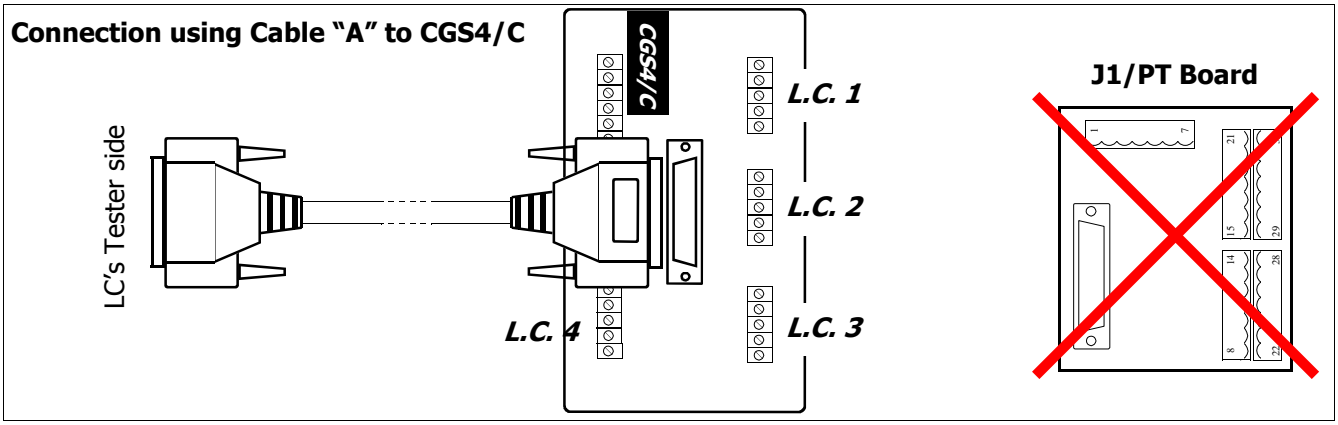
LOAD CELL 2	
15	SHIELD
16	- EXCITATION
17	+ EXCITATION
18	+ SENSE
19	- SENSE
20	- SIGNAL
21	+ SIGNAL

LOAD CELL 3	
22	+ SIGNAL
23	- SIGNAL
24	- SENSE
25	+ SENSE
26	+ EXCITATION
27	- EXCITATION
28	SHIELD

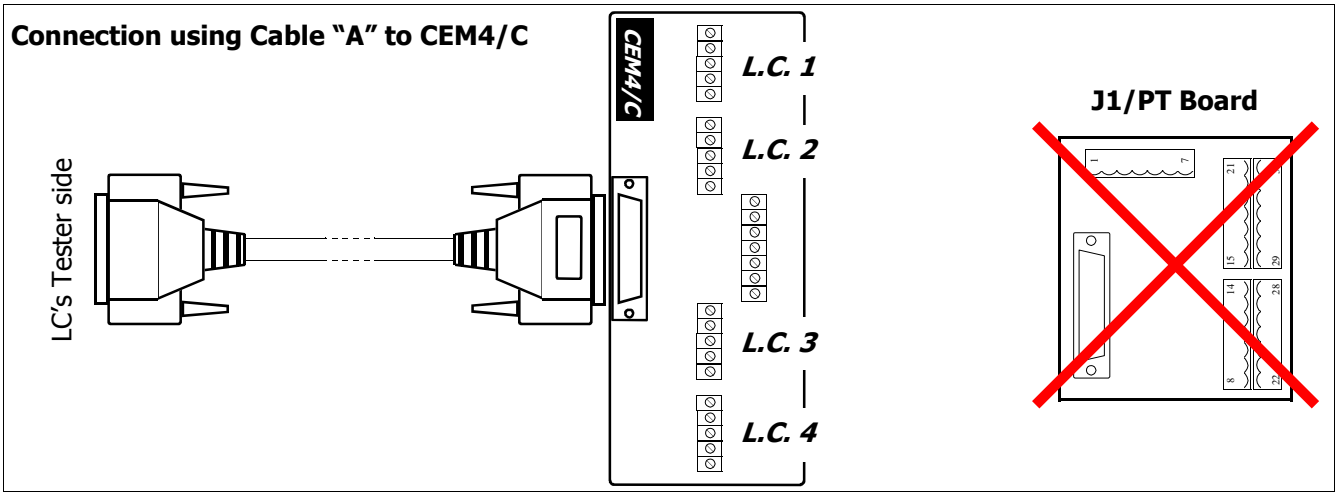
LOAD CELL 4	
29	+ SIGNAL
30	- SIGNAL
31	- SENSE
32	+ SENSE
33	+ EXCITATION
34	- EXCITATION
35	SHIELD

If the existing installation is equipped with model CGS4/C or model CEM4/C summing junction board, only connect Cable "A" directly to the 25 pin Sub-D connector on the board, without using the J1/PT Board.

Connection using Cable "A" to CGS4/C



Connection using Cable "A" to CEM4/C



CONNECTION TO THE LOAD CELLS with Cable "B"

Cable "B", is equipped with spring terminals and is available as an OPTION.

The cable "B" represents a universal connection system, no matter which type of junction box the LC's are normally connected to. The cables of the load cells must be disconnected from their terminals and connected to the spring terminals of the cable "B" according to the wiring shown here below.

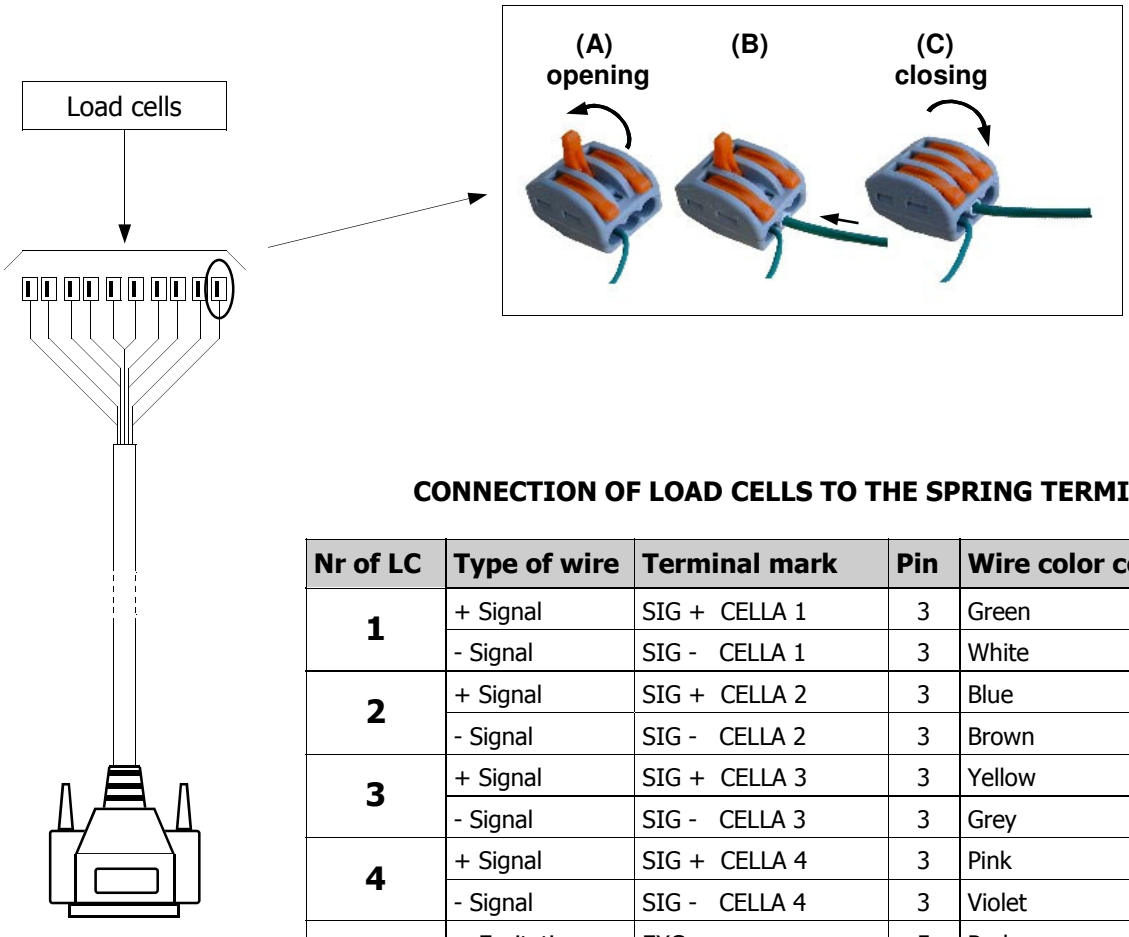
Cable "B" is equipped with **10 spring terminals**, eight with 3 pin and two with 5 pin (all the pins on each terminal are short circuited):

- The **8 terminals with 3 pin** must be used for connecting **+ and - Signal of each single load cell**.
- The **2 terminals with 5 pin** must be used for connecting **+ and - Excitation**.

Each single wire must be plugged into its own terminal.

An adhesive sticker on each terminal identifies: Number of the load cell (1, 2, 3, 4).
Type of wire (Signal or Excitation).
Polarity (+ / -) of each single connection.

Follow the steps (A), (B) and (C) to perform the connections.



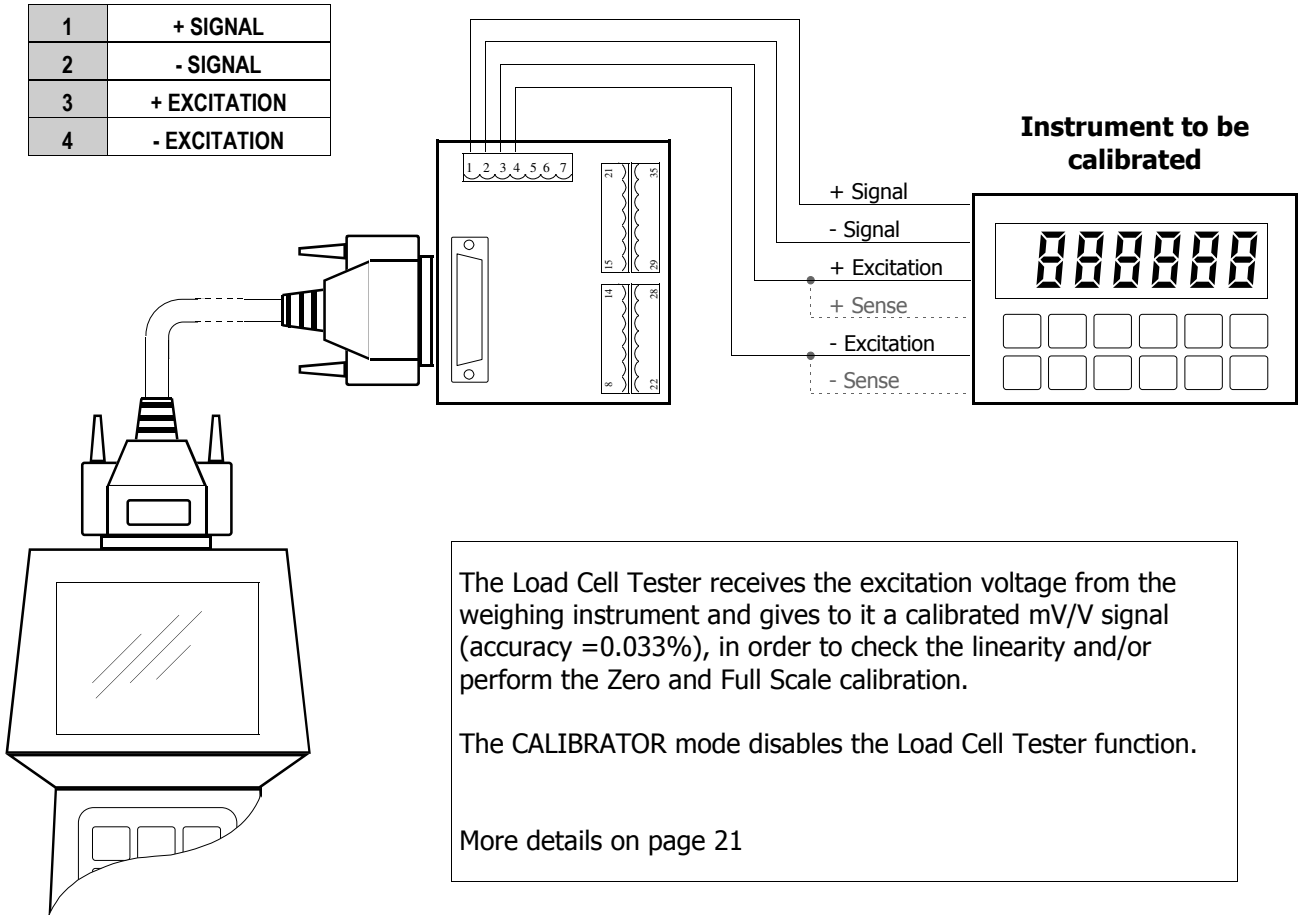
CONNECTION OF LOAD CELLS TO THE SPRING TERMINALS

Nr of LC	Type of wire	Terminal mark	Pin	Wire color code (cable B)
1	+ Signal	SIG + CELLA 1	3	Green
	- Signal	SIG - CELLA 1	3	White
2	+ Signal	SIG + CELLA 2	3	Blue
	- Signal	SIG - CELLA 2	3	Brown
3	+ Signal	SIG + CELLA 3	3	Yellow
	- Signal	SIG - CELLA 3	3	Grey
4	+ Signal	SIG + CELLA 4	3	Pink
	- Signal	SIG - CELLA 4	3	Violet
1-2-3-4	+ Excitation	EXC +	5	Red
	- Excitation	EXC -	5	Black

USING THE LOAD CELL TESTER IN "CALIBRATOR" MODE WITH J1/PT BOARD

The J1/PT Terminal Board, **supplied with cable "A"**, includes terminals for connecting directly to the weight indicator when using the load cell tester in "Calibrator" mode. The following table shows which pins to use.

1	+ SIGNAL
2	- SIGNAL
3	+ EXCITATION
4	- EXCITATION

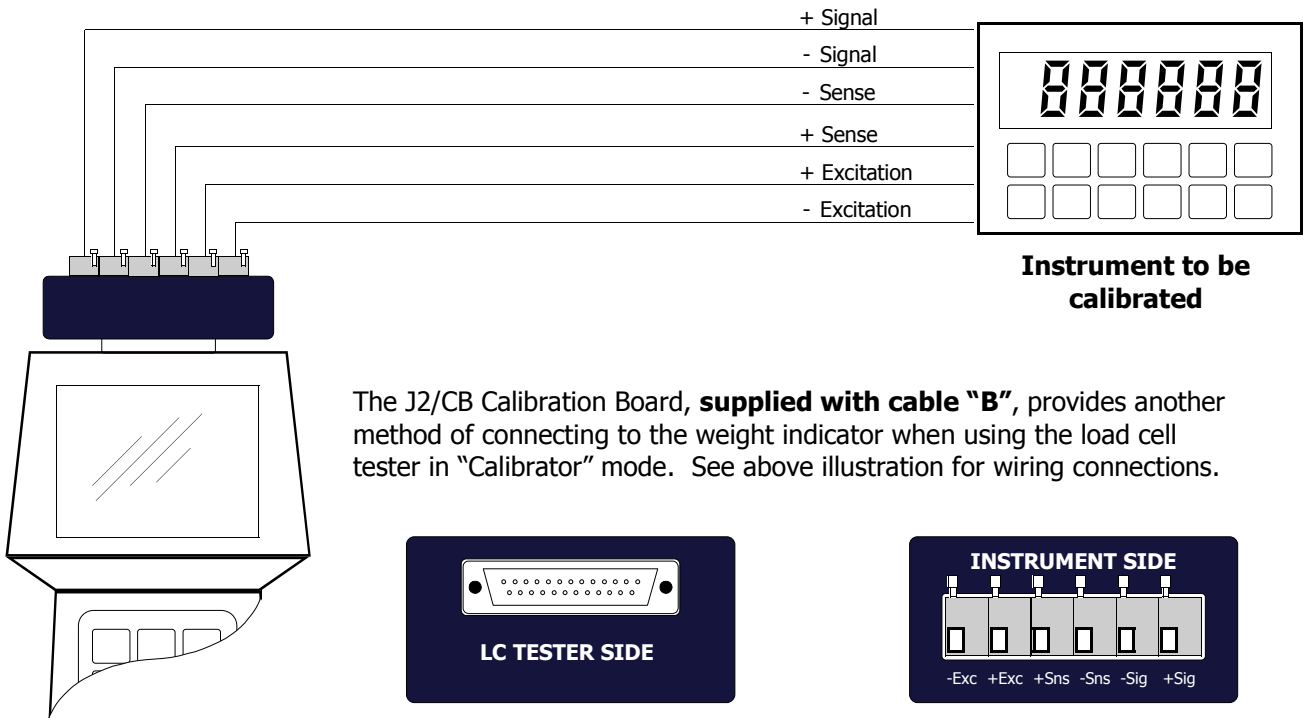


The Load Cell Tester receives the excitation voltage from the weighing instrument and gives to it a calibrated mV/V signal (accuracy =0.033%), in order to check the linearity and/or perform the Zero and Full Scale calibration.

The CALIBRATOR mode disables the Load Cell Tester function.

More details on page 21

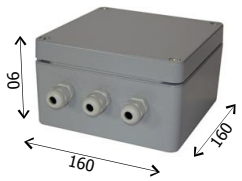
USING THE LOAD CELL TESTER IN "CALIBRATOR" MODE WITH J2/CB BOARD



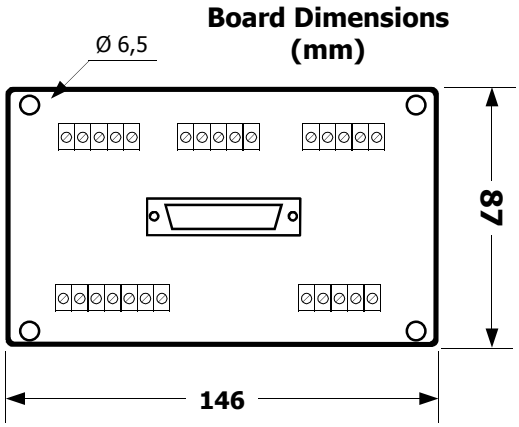
The J2/CB Calibration Board, **supplied with cable "B"**, provides another method of connecting to the weight indicator when using the load cell tester in "Calibrator" mode. See above illustration for wiring connections.

CGS4/C and CEM4/C SUMMING JUNCTION BOXES

The CGS4/C and CEM4/C summing junction boxes, are equipped with a 25 pin Sub-D connector, which provides a quick reliable connection to the Model 1006 LC System Tester with standard Cable "A".



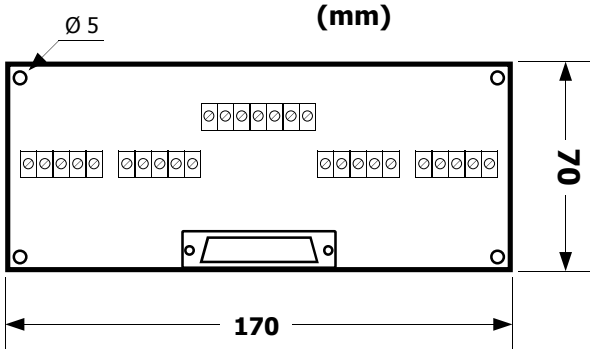
Box Dimensions (mm)



Board Dimensions (mm)

CGS4/C

Box Dimensions (mm)



Board Dimensions (mm)

CEM4/C

In order to use the LC System Tester on weighing systems using summing J-boxes other than the CGS4/C or CEM4/C, we are offering our customers a free evaluation for installing a 25 pin Sub-D connector on their own summing junction boards.

If you would like to take advantage of this offer, we would require detailed drawings or a sample of the summing J-Boxes that you are currently using.

KEY FUNCTIONS IN OPERATING MODE

Display intensity adjustment (see page 20)

Switching between LOAD CELL TESTER and CALIBRATOR modes

Navigating through the various display views in LOAD CELL TESTER mode (see page 14)

Access to configuration menu

Short press: access to "WEIGHING PARAMETERS" (see page 15)
Long press: access to " SETUP MENU" (see page 17)

Zero the weight value in CALIBRATOR mode (see page 21)

Erase the zero of the weight value in CALIBRATOR mode (see page 21)

Coarse increment (in 0.1 mV/V steps) of the output signal in CALIBRATOR mode (see page 21)

Coarse decrement (in 0.1 mV/V steps) of the output signal in CALIBRATOR mode (see page 21)

Fine increment of the mV/V output signal in CALIBRATOR mode (see page 21)

Fine decrement of the mV/V output signal in CALIBRATOR mode (see page 21)

Switch-off

KEY FUNCTIONS WITHIN THE VARIOUS MENUS

Data Selection (from a list)

They take meaning of "**Arrow up**" and "**Arrow down**".
They allow to select the previous/next parameter from a list of parameters proposed by the instrument

Sometimes the selection of a certain parameter is performed with these keys instead of with the Arrow up/down keys.
The symbols **+** and **—** appear on the display to inform the Operator.

Takes meaning of "**Arrow right**".
Allows to access the parameter previously selected with Arrow up/down keys.

Takes meaning of "**Arrow left**".
Exits the menu without saving the changes

Exits the menu after saving the changes

Entering Numerical Data

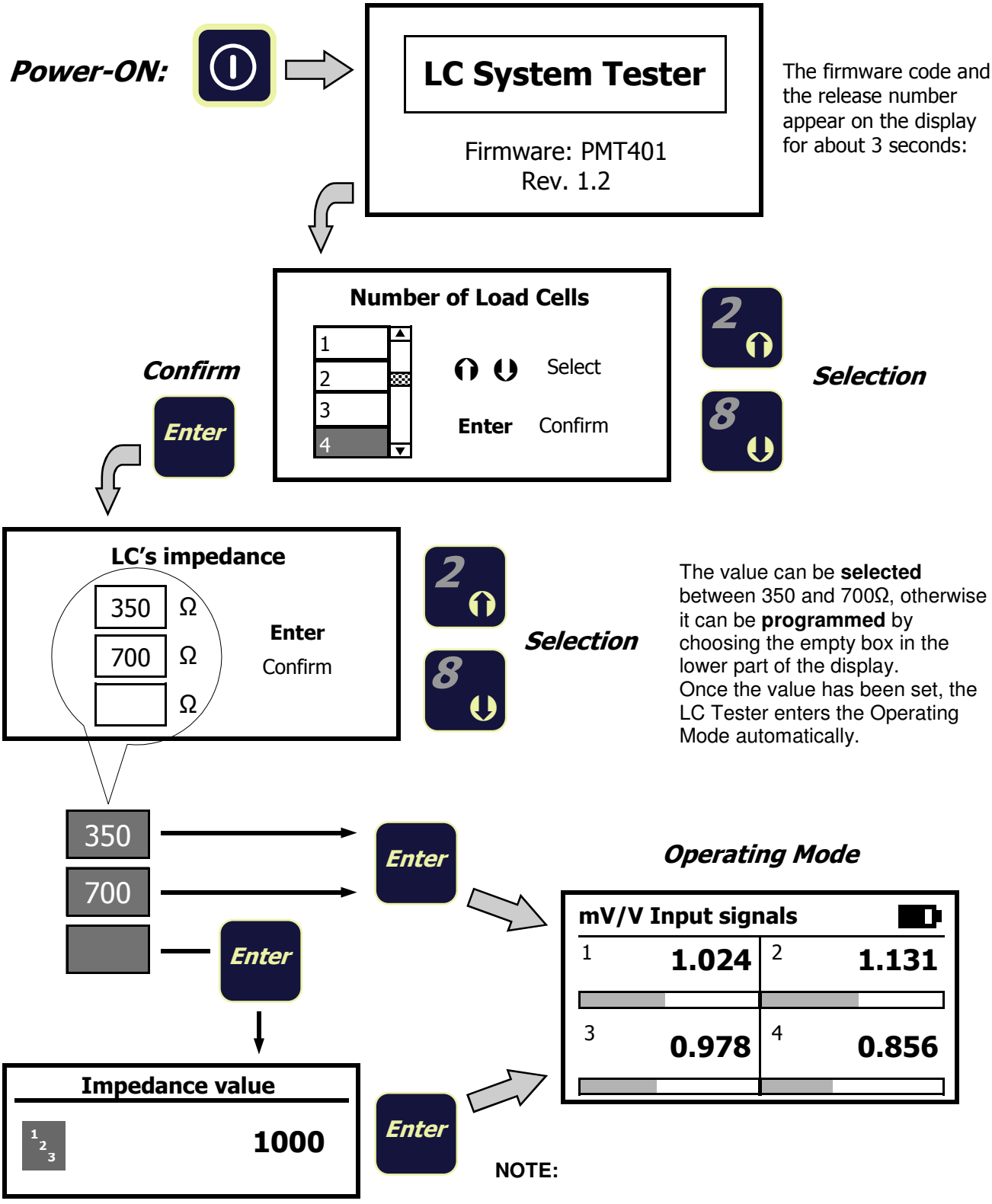
Keys 0 to 9 are used to program all those parameters requiring numerical values, such as the load cell capacity, etc.

This key performs 2 functions:
1. Used to insert a decimal point in numerical values.
2. Used to erase the data: Press momentarily to erase the last digit
   Press slightly longer to erase all of the data

Confirm and quit the settings.

POWER-ON SEQUENCE

When **powering-on** the LC Tester the following parameters **must** be programmed**:**
Number of load cells - Load cells Impedance.



Min. programmable value: 300Ω
Max. programmable value: 2000Ω
Decimal values will be automatically rounded to the lower integer value.

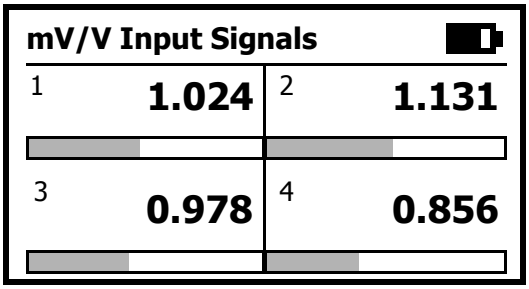
NOTE:

In case the last switch-off of the LC Tester was caused by the Auto Shut Off function (see page 18), the LC Tester immediately resumes the Operating Mode, without asking for the LC's Number and Impedance to be programmed.
The instrument's memory will keep the stored values.

OPERATING MODE : DATA VISUALIZATION

During normal operation in Load Cell Tester mode (see page 6), the “SWITCH VIEW” key switches the display among 4 different views.

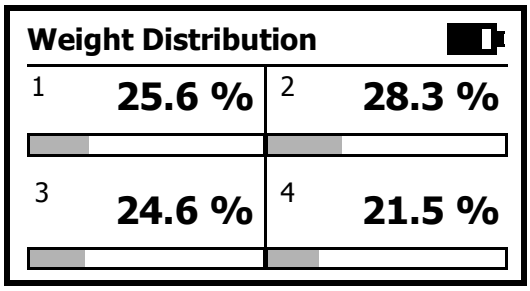
1



Individual mV/V values coming from the load cells

Switch view

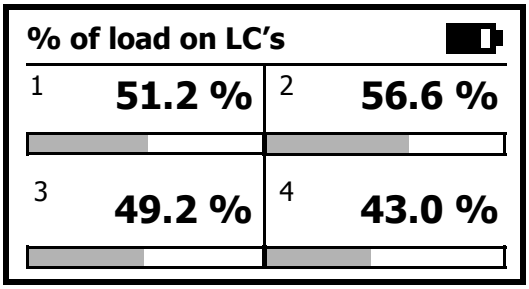
2



Distribution of the weight on the load cells
Ideal distribution: 25% each LC

Switch view

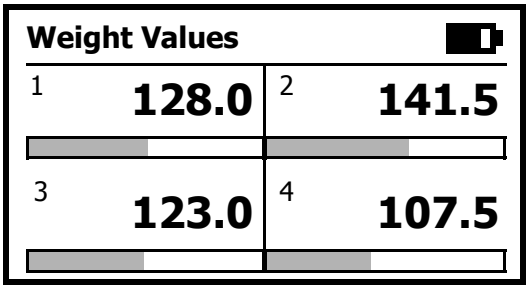
3



Load on each load cell compared to its nominal capacity

Switch view

4

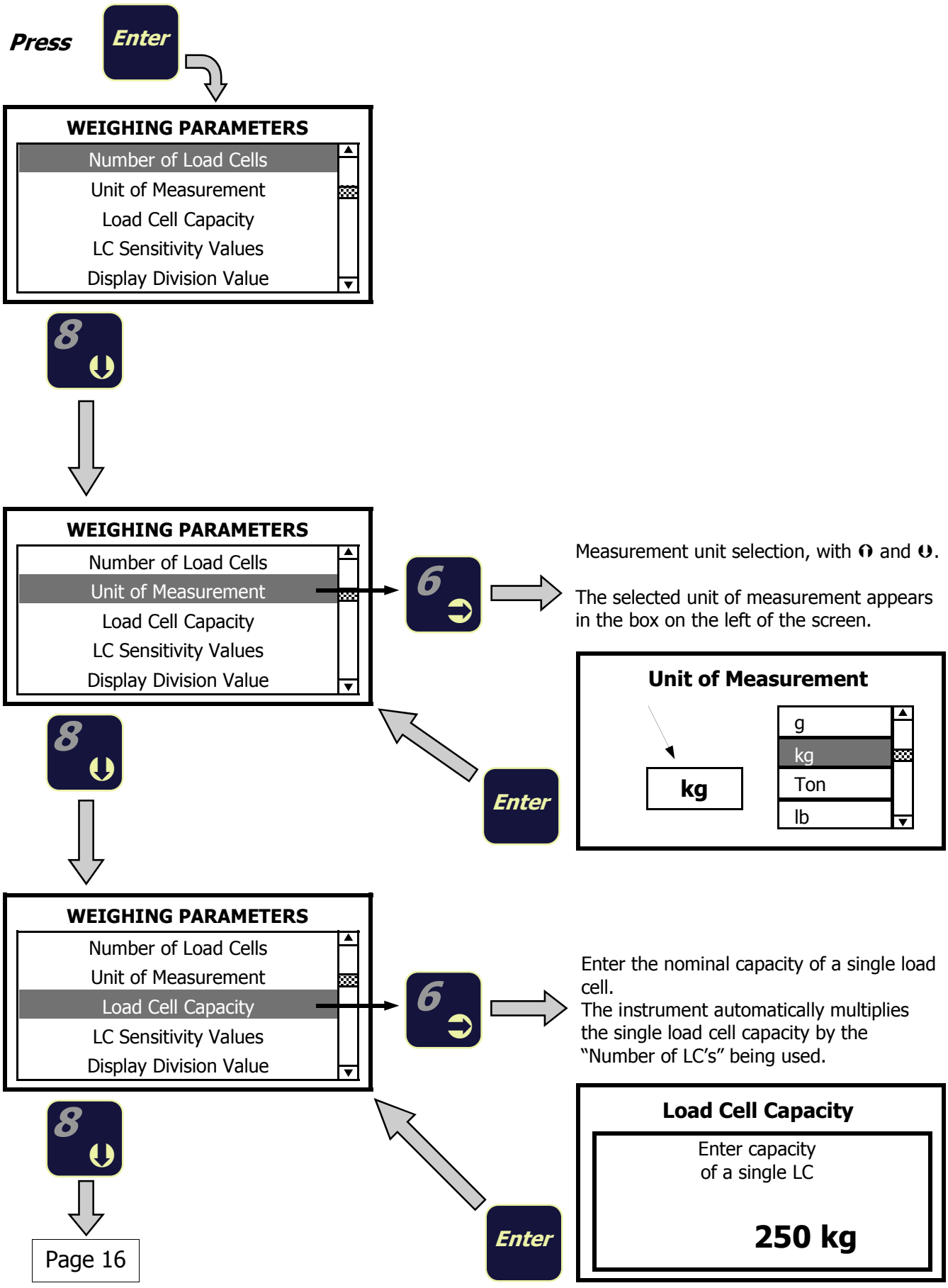


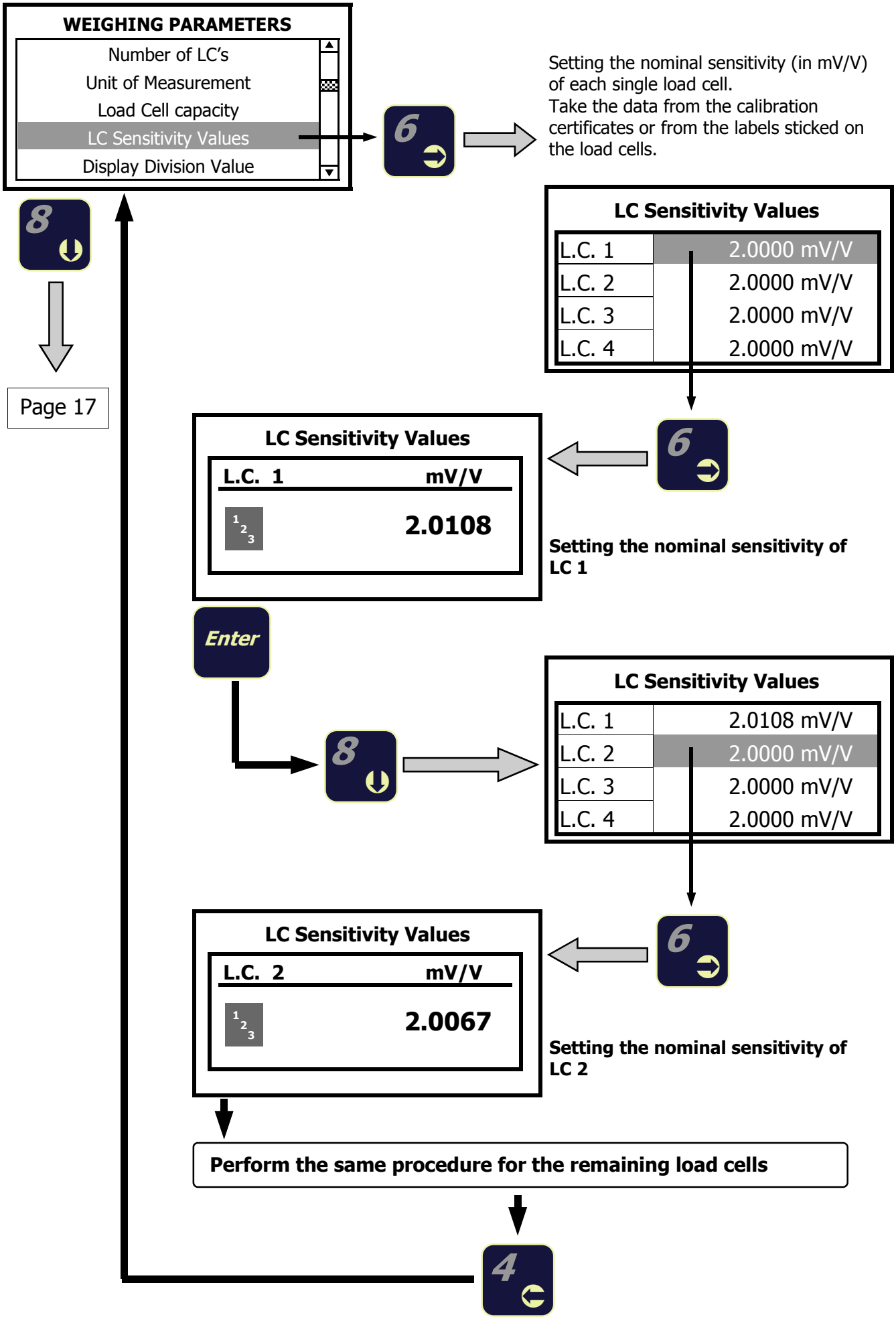
Weight value on each load cell. Expressed in the selected unit of measurement.

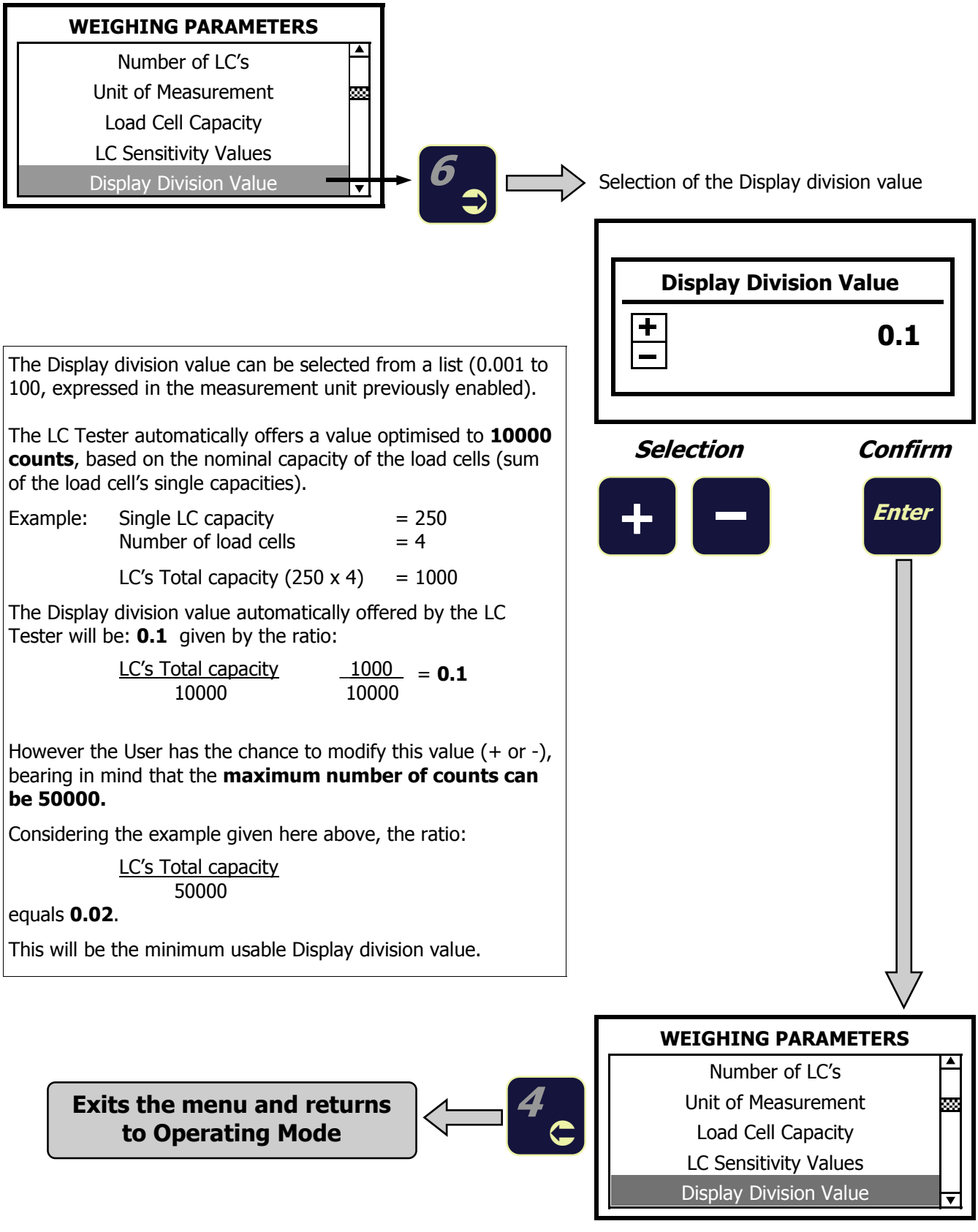
NOTE: Display views 3 (% of load on LC's) and 4 (Weight values) give significant values only if the load cell single capacity and sensitivities have been programmed.

"WEIGHING PARAMETERS" MENU

In Operating Mode:




WEIGHING PARAMETERS
Number of LC's
Unit of Measurement
Load Cell capacity
LC Sensitivity Values
Display Division Value
6
Setting the nominal sensitivity (in mV/V) of each single load cell.
Take the data from the calibration certificates or from the labels sticked on the load cells.
8
Page 17
LC Sensitivity Values
L.C. 1 2.0000 mV/V
L.C. 2 2.0000 mV/V
L.C. 3 2.0000 mV/V
L.C. 4 2.0000 mV/V
6
LC Sensitivity Values
L.C. 1 mV/V
2.0108
Setting the nominal sensitivity of LC 1
Enter
8
LC Sensitivity Values
L.C. 1 2.0108 mV/V
L.C. 2 2.0000 mV/V
L.C. 3 2.0000 mV/V
L.C. 4 2.0000 mV/V
6
LC Sensitivity Values
L.C. 2 mV/V
2.0067
Setting the nominal sensitivity of LC 2
Perform the same procedure for the remaining load cells
4



The Display division value can be selected from a list (0.001 to 100, expressed in the measurement unit previously enabled).

The LC Tester automatically offers a value optimised to **10000 counts**, based on the nominal capacity of the load cells (sum of the load cell's single capacities).

Example: Single LC capacity = 250
Number of load cells = 4

LC's Total capacity (250 x 4) = 1000

The Display division value automatically offered by the LC Tester will be: **0.1** given by the ratio:

$$\frac{\text{LC's Total capacity}}{10000} \qquad \frac{1000}{10000} = \mathbf{0.1}$$

However the User has the chance to modify this value (+ or -), bearing in mind that the **maximum number of counts can be 50000.**

Considering the example given here above, the ratio:

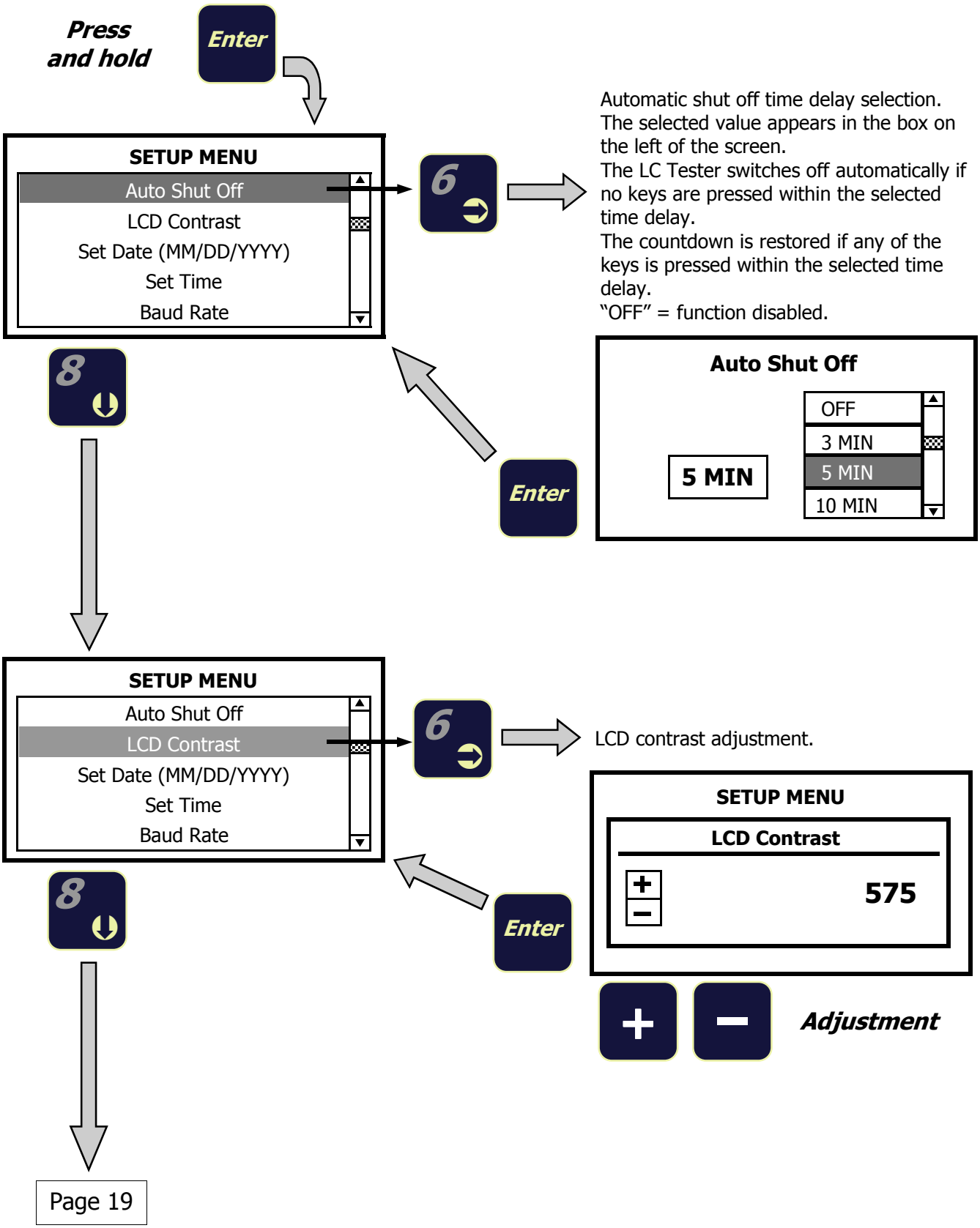
$$\frac{\text{LC's Total capacity}}{50000}$$

equals **0.02**.

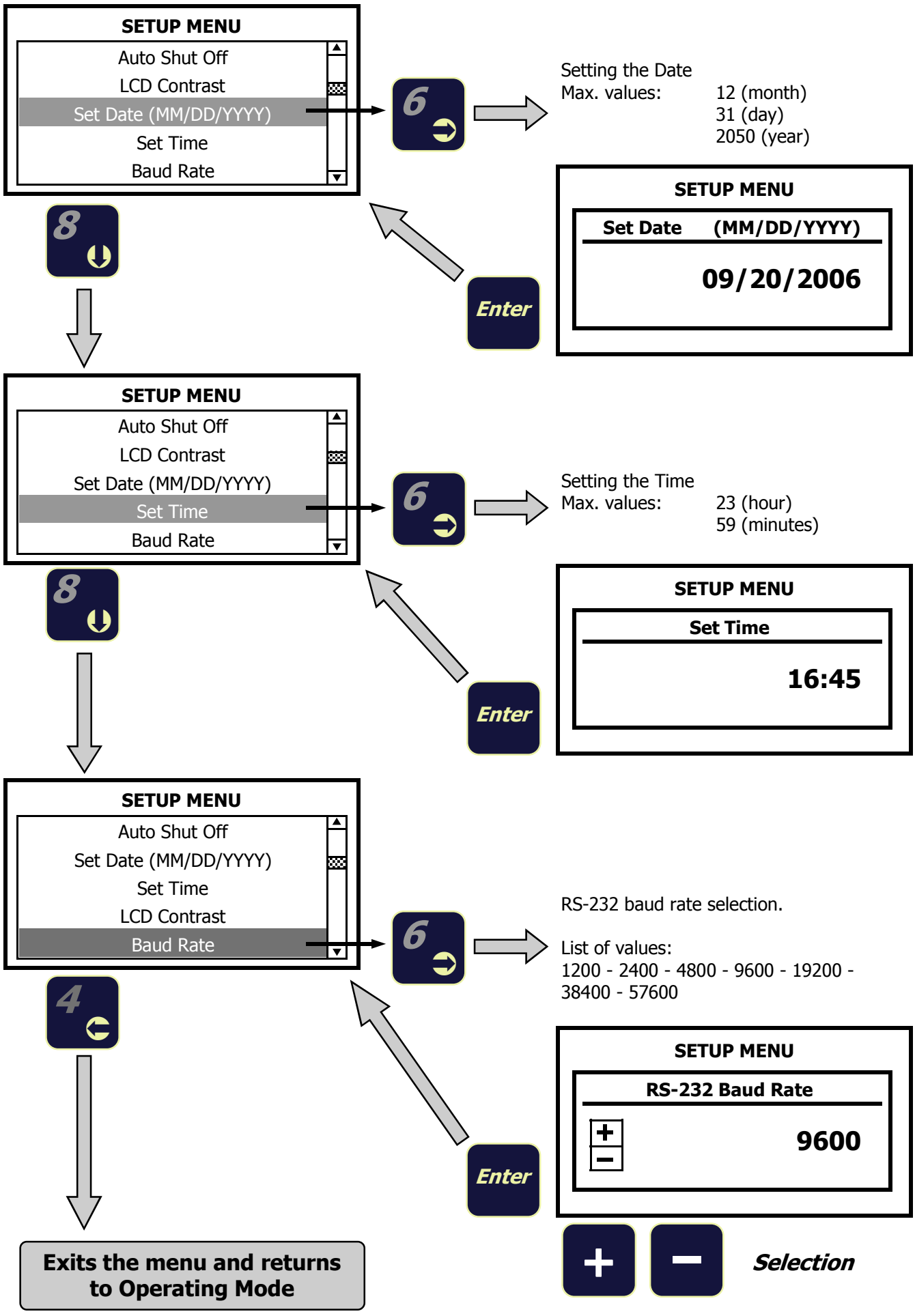
This will be the minimum usable Display division value.

ADDITIONAL FUNCTIONS

In Operating Mode:

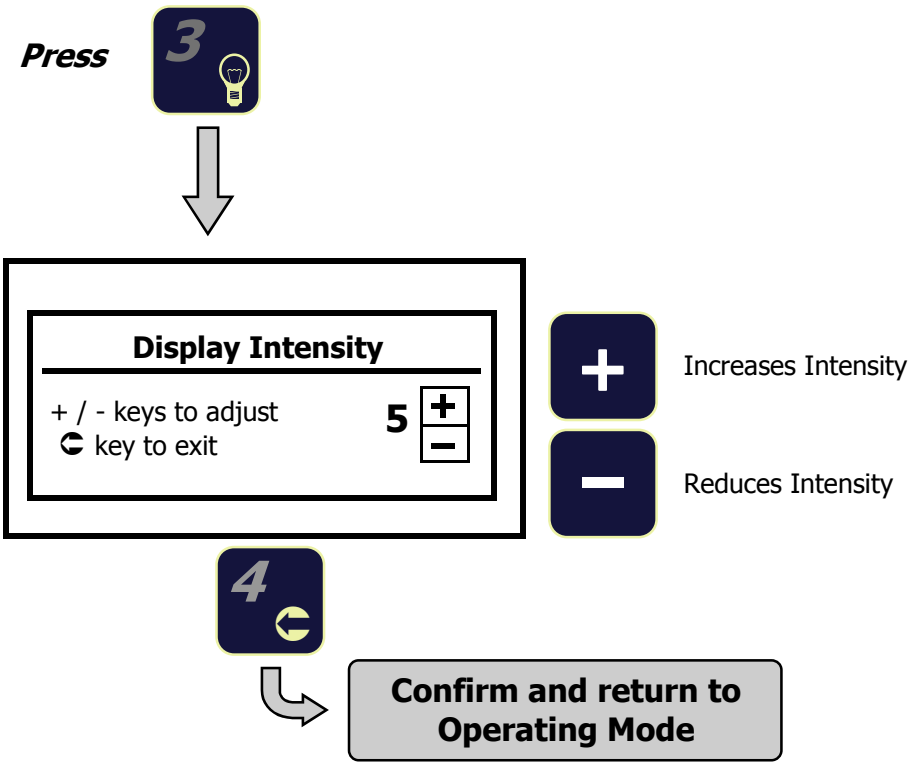


Page 19


SETUP MENU
Auto Shut Off
LCD Contrast
Set Date (MM/DD/YYYY)
Set Time
Baud Rate
6
8
Enter
Setting the Date
Max. values: 12 (month)
31 (day)
2050 (year)
SETUP MENU
Set Date (MM/DD/YYYY)
09/20/2006
SETUP MENU
Auto Shut Off
LCD Contrast
Set Date (MM/DD/YYYY)
Set Time
Baud Rate
6
8
Enter
Setting the Time
Max. values: 23 (hour)
59 (minutes)
SETUP MENU
Set Time
16:45
SETUP MENU
Auto Shut Off
Set Date (MM/DD/YYYY)
Set Time
LCD Contrast
Baud Rate
6
4
Enter
RS-232 baud rate selection.
List of values:
1200 - 2400 - 4800 - 9600 - 19200 -
38400 - 57600
SETUP MENU
RS-232 Baud Rate
9600
Selection
Exits the menu and returns to Operating Mode

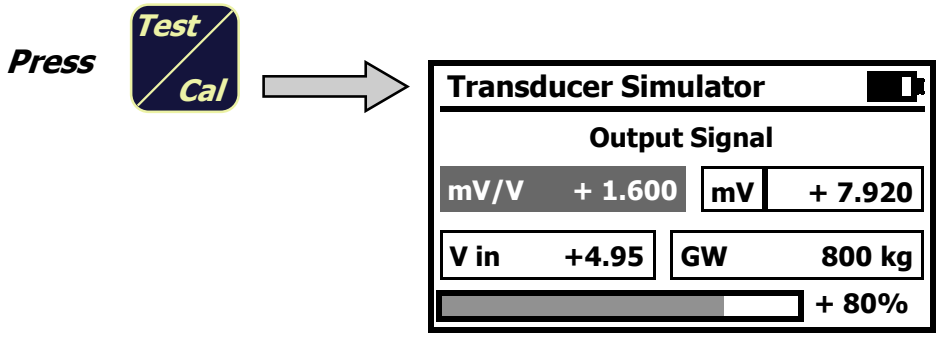
DISPLAY INTENSITY ADJUSTMENT

In Operating Mode:



THE "CALIBRATOR" FUNCTION

How to enable the function:



Through this function the LC Tester acts as a **mV generator,** therefore it can be used as a load cell simulator and/or calibrator for electronic weighing instruments, to check linearity, to check 0 and FS, to perform 0 and FS calibration.
Refer to page 9 for wiring.

Displayed data

mV/V + 1.600

mV/V signal generated by the LC Tester and sent to the instrument.
The ↑ and ↓ keys allow to generate the signal output (in steps of 0.1 mV/V) over a range from 0 to FS.
The mV/V Full Scale value corresponds to the average of the individual mV/V load cell sensitivities programmed in the "WEIGHING PARAMETERS" menu. See page 16.

V in +4.95

Load cells excitation voltage coming from the instrumentation.

mV + 7.920

mV signal generated by the LC Tester and sent to the instrument.
This value is the product of "mV/V" multiplied by "Vin".

PL 900 kg

Weight value corresponding to the mV/V signal generated by the LC Tester.
The weight value is expressed in the preselected measurement unit and its Full Scale is the product of "Single LC capacity" multiplied by "Number of LC's", programmed in the "WEIGHING PARAMETERS" menu.

+ 80% Percentage of signal output referred to the Full Scale.

In order for the "CALIBRATOR" function to work correctly, the following parameters "Number of LC's", "LC's sensitivity" and "Single LC capacity" programmed in the LC Tester must be the same as those programmed in the instrument to be controlled.
Example:
If the instrument to be controlled is normally connected to 4 load cells 250 kg each, 2 mV/V, the LC Tester must have been programmed with the same data (see pages 15-17):
Number of LC's = 4 - LC's sensitivity = 2.0000 - Single LC capacity = 250.

Key functions in "CALIBRATOR" mode

Coarse increment of the mV signal output. Each step = 0.1 mV/V.
Range from 0 to F.S.

Coarse decrement of the mV signal output. Each step = 0.1 mV/V.
Range from 0 to F.S.

Fine increment of the mV signal output.

Fine decrement of the mV signal output.

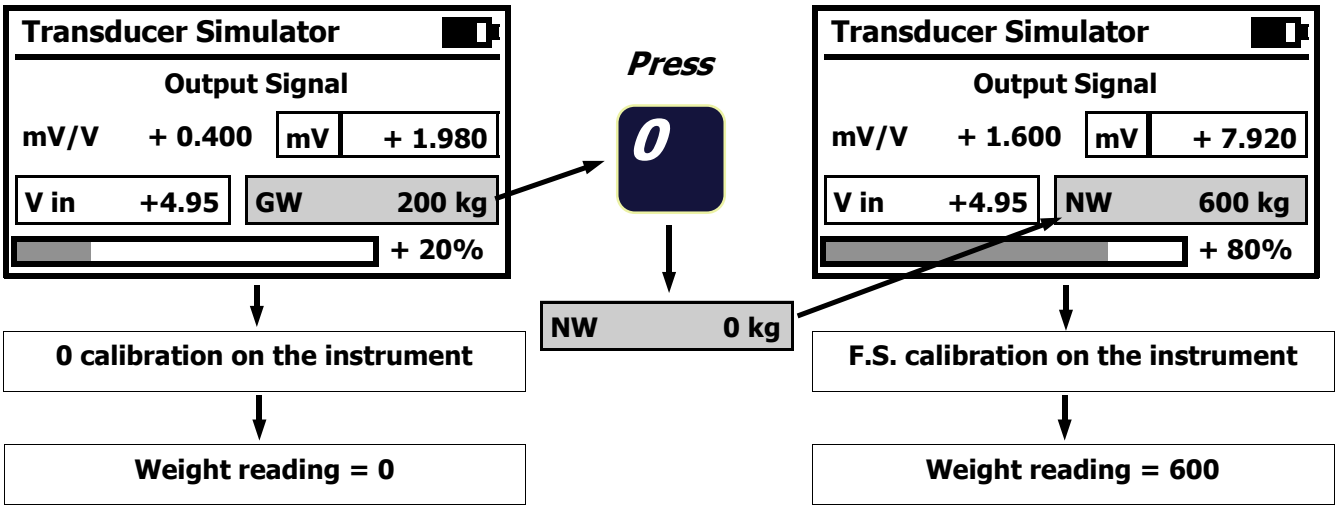
Set to 0 the weight value

Erases the weight value 0 setting

Zeroing the weight value shown on the LC Tester

This function helps the User during the zero and full scale calibration of the weighing instrumentation.
After having performed the zero calibration on the instrument, the user can set to zero the weight value displayed by the LC Tester also, so that the weight values displayed by the two devices can match.

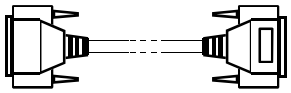
Example: weighing system comprised of an instrument connected to 4 load cells 250 kg each - 2 mV/V (total 1000 kg), dead load = 200 kg, live weight = 600 kg.
The 0 calibration must be performed with a signal of 0,4 mV/V (equivalent to 200 kg), while the F.S. calibration must be performed with a signal of 1.6 mV/V (equivalent to a signal increment of 1.2 mV/V = 600 kg)



Note: When the "0" key is pressed the box containing the weight value switches from GW to NW.
Press the "C" key to switch from NW to GW. **GW** = **G**ross **W**eight - **NW** = **N**et **W**eight.

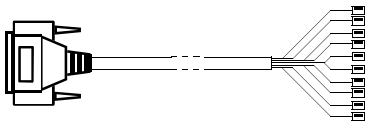
ACCESSORIES, OPTIONS AND SPARE PARTS

Cable "A" 2m long with two 25-pin connectors



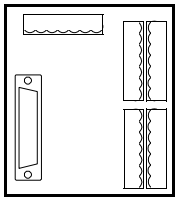
Product Code: 1006/A

Cable "B" 3m long with spring terminals



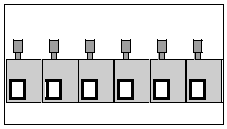
Product Code: 1006/B

Screw Terminal Board
Model J1/PT



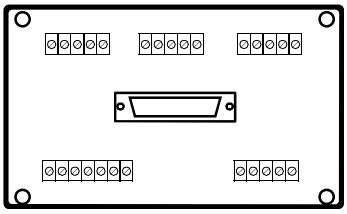
Product Code: 1006/PT

Spring Terminal Calibration Board
Model J2/CB



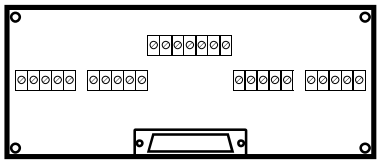
Product Code: 1006/CB

Summing Junction Box - Model CGS4/C



Product Code: 1006/CGS

Summing Junction Box - Model CEM4/C



Product Code: 1006/CEM

Software program for saving the Configuration Files

Special software program allows saving all the weighing parameters for up to 100 different systems. These files can be stored directly inside of the load cell tester.

All of the data (number of load cells, capacity, sensitivity, unit of measurement, division value) can be stored in up to 100 different files which can be recalled when needed. This feature expedites load cell tester set-up time by eliminating the need of having to re-enter all of the parameters.

It is also possible to save the zero and f/s mV/V values for each system for ease of any periodical checking. The configuration files can be set and stored directly from the instrument's keyboard, or with an Excel chart which can be created on a PC and then transferred to the LC Tester via the RS-232 serial port.

The bi-directional communication feature allows transferring the files from the load cell tester to a computer.

Product Code: 1006/SW

APPENDIX "A"

CONFIGURATION FILE MANAGEMENT

This section of the manual covers an OPTIONAL function that can only be activated by purchasing a PASSWORD.

Please contact the Manufacturers Sales Department for Terms and Conditions.

Please refer to page 25 for a general description of the Configuration File Management option.

The CONFIGURATION FILE MANAGEMENT

This function enables storage of up to **100 Configuration Files** inside of the Load Cell Tester, each File contains all the weighing parameters for up to 100 different systems.
The Configuration File management is performed using the **Save**, **Open**, **Delete**, **Transfer File** functions.
Each file is identified by a name consisting of 8 alphanumeric characters.
The Configuration File function expedites load cell tester set-up time by eliminating the need of having to re-enter all of the parameters.

The following weighing parameters can be stored in each configuration file:

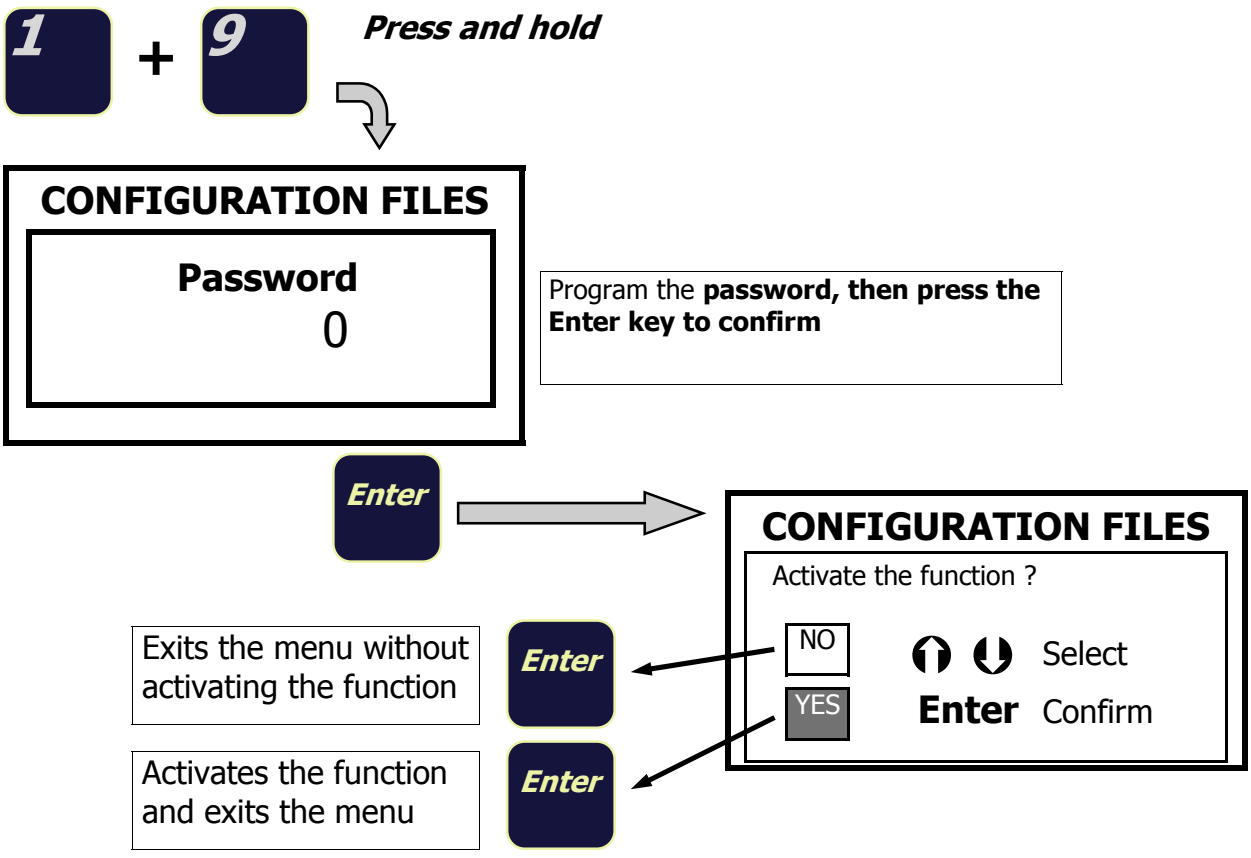
- Number of load cells (see page 13)
- Load cell nominal capacities (see page 15)
- Unit of measurement for the weight values (see page 15)
- Individual load cell sensitivities (see page 16)
- Display division value (see page 17)

It is also possible to save the zero and f/s mV/V values for each system for ease of any periodic checking. These stored mV/V values can be generated by the Load Cell Tester when being used as a "Calibrator", in order to calibrate the **Zero and Full Scale of the instrumentation** installed in the weighing system.

The configuration files can be set and stored directly from the instrument's keyboard, or with an Excel chart which can be created on a PC and then transferred to the LC Tester via the RS-232 serial port.

The bi-directional communication feature allows transferring the files from the load cell tester to a computer.

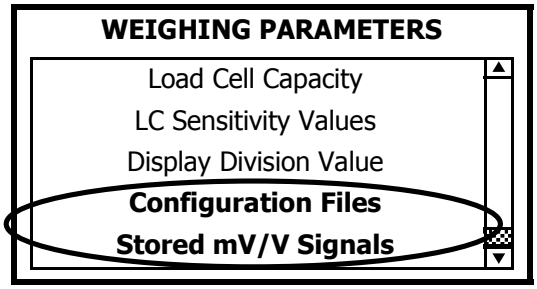
Procedure for activating the CONFIGURATION FILES management



Once the "CONFIGURATION FILES" function has been activated, the following selections are automatically added to the "WEIGHING PARAMETERS" menu:

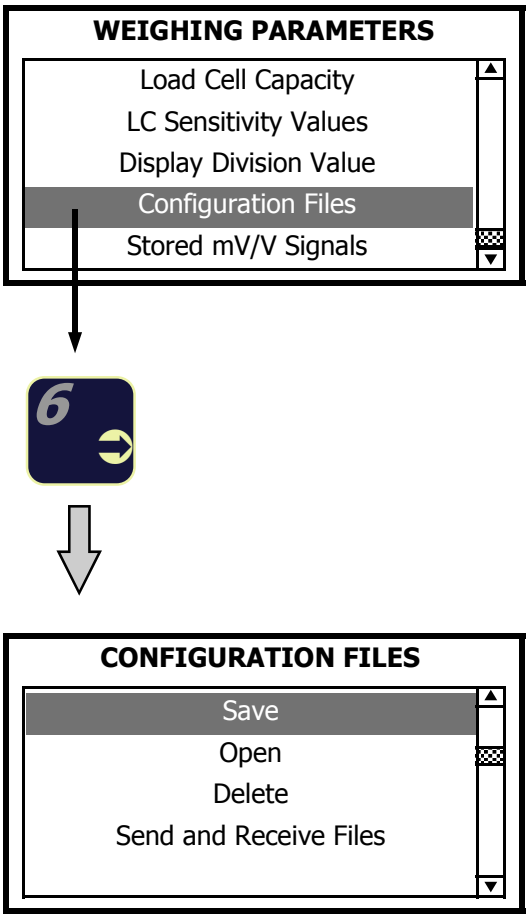
- **Configuration Files**
- **Stored mV/V Signals**

Therefore, the last part of the "WEIGHING PARAMETERS" menu will appear as follows:



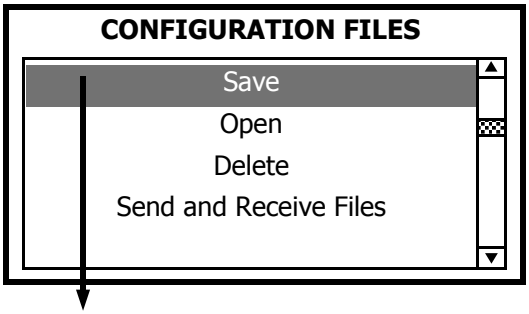
NOTE:
Access to the "WEIGHING PARAMETERS" menu is performed by pressing the ENTER key, as described on page 15 of this Manual.

Accessing the CONFIGURATION FILES menu



Use the arrow up/down keys to highlight the "Configuration Files" selection, then press the arrow right to access the menu.

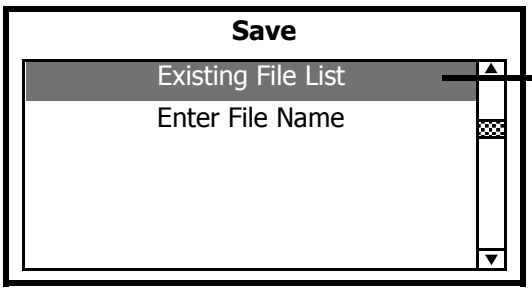
Saving the weighing parameters in a file

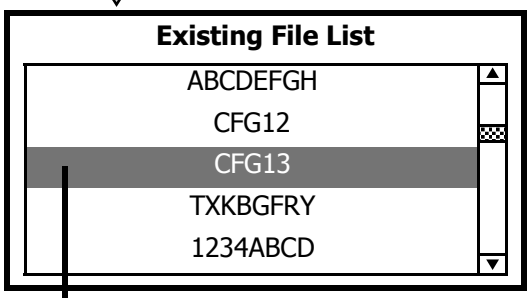


The **Save** function is used to store all the data previously programmed in the WEIGHING PARAMETERS menu in a file using one of the following methods:

1. **Save the data into an existing file**
2. **Save the data into a new file**

1. Saving data to an existing file

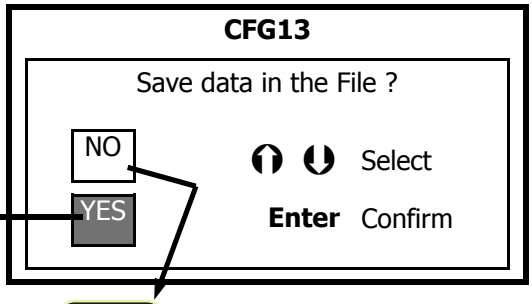




The ↑ ↓ keys scroll **UP** and **DOWN** the list of existing files.

The → key **access** the selected file.

The ← key **quits** the menu step by step until normal operating mode is resumed.



Next page

Enter

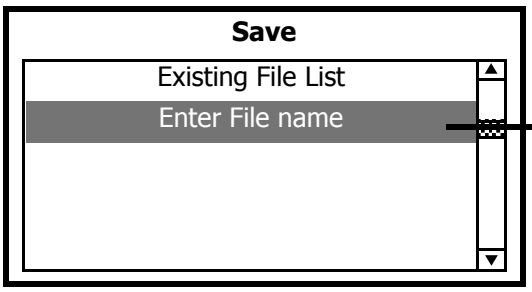
Exits the menu and **saves the data.** Normal operating mode is automatically resumed

Enter

Exits the menu **without saving the data.** Display returns to **Save** menu.

2. Saving data in a <u>new file</u>

From previous page



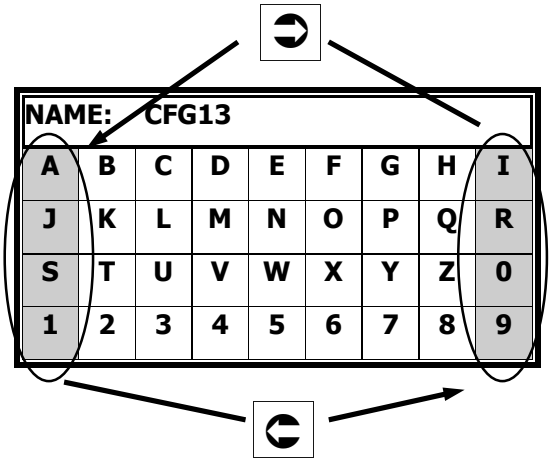
Creating a new file
Entering the file name:

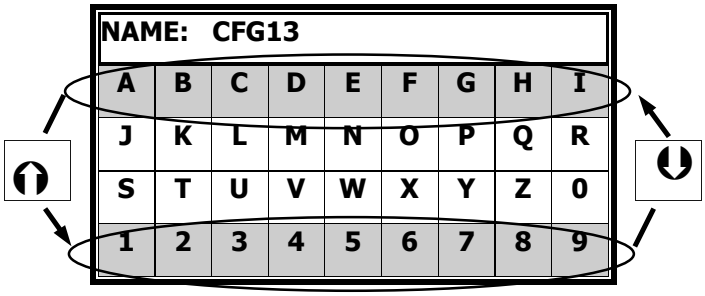
The following grid appears on the display.
The letter "A" is highlighted.

NAME:								
A	B	C	D	E	F	G	H	I
J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	0
1	2	3	4	5	6	7	8	9

KEY FUNCTIONS

The 2 8 4 6 keys allow to move the cursor to any direction and also to pass from one to the other side of the grid without the need to scroll all the characters of the line /column, see the pictures here below:





Enter **-Short pressure:** Enters the selected character and allows the selection for the next one.
The character just entered will appear in the "NAME" field.
When the last character (the 8th) is entered the ***Enter*** key causes the storage of all the weighing parameters into the file just created.

-Long pressure: Stores the weighing parameters into a file named with less than 8 characters.
Exits the procedure without saving any data if no characters were previously entered.

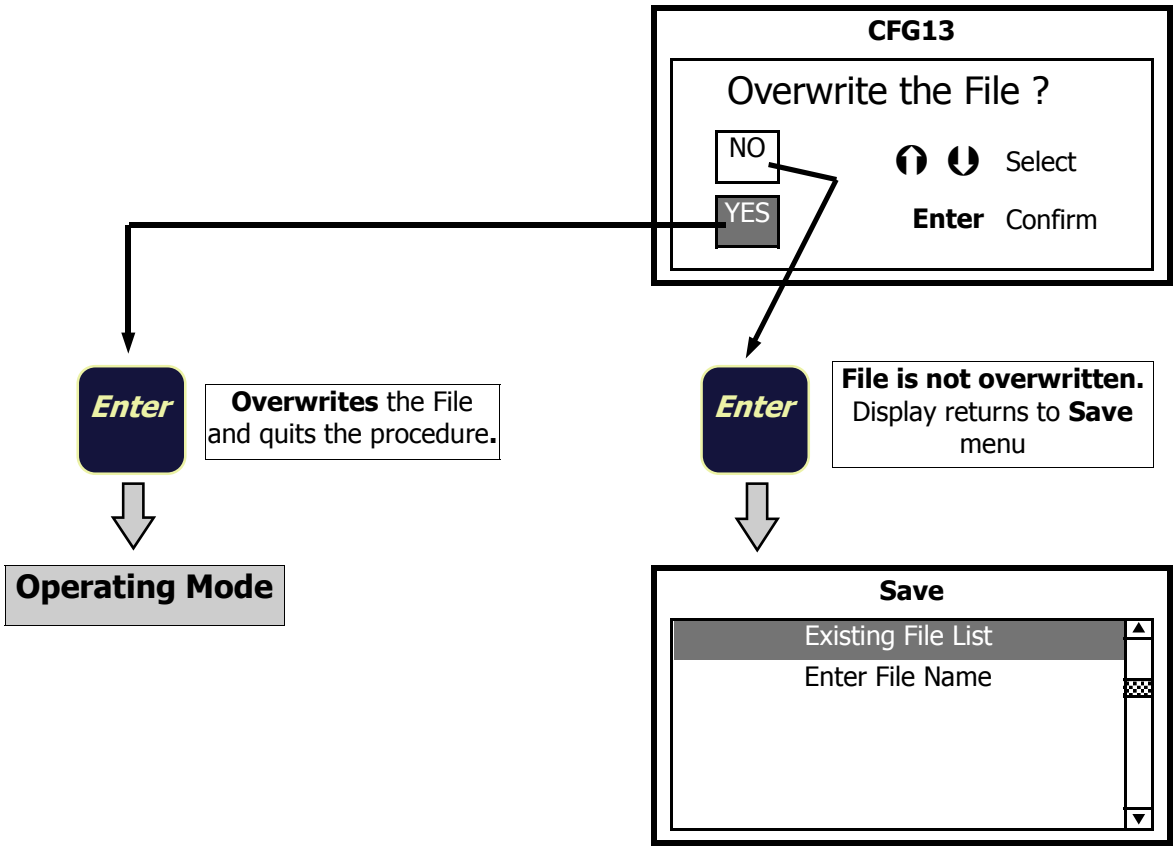
Quitting the procedure means to resume **normal operating mode.**

C . -Press for about 1 second to erase the last character entered.

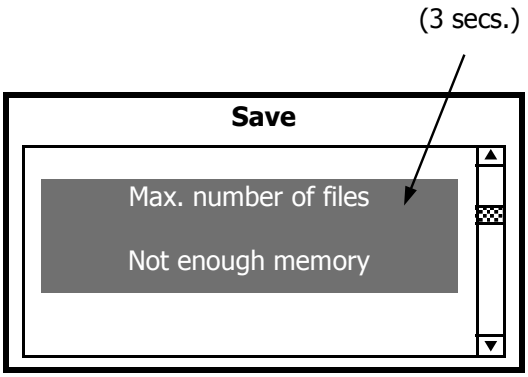
-Press for a longer time to erase the entire name.

– Exits the procedure and resumes normal operating mode
No data storage.

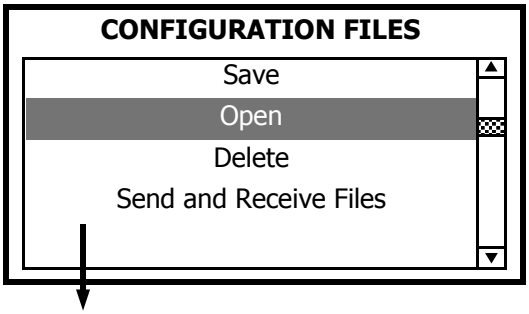
If the new file name matches an existing file name, the following message will appear on the display:



A warning message appears on the display in case the maximum number of files (100) is reached.



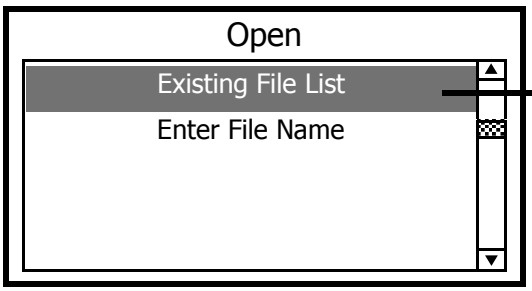
Opening a Configuration File

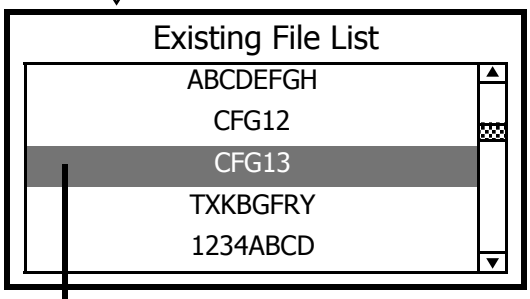


The **Open** function is used to recall a file from the instrument's memory and make it "operative".
This procedure can be performed in two different ways:

1. **Opening a file from the existing file list.**
2. **Opening a file by entering the name.**

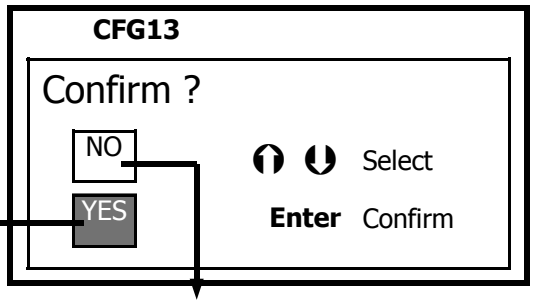
1. Opening a file from the existing file list





Next page

The ↑ ↓ keys scroll **UP** and **DOWN** the list of existing files.
The → key **opens** the selected file.
The ← key **quits** the menu step by step until normal operating mode is resumed.

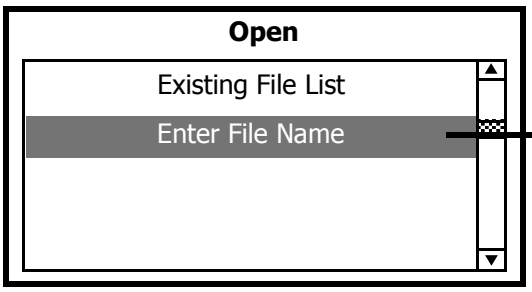


Exits the menu and **opens the selected file.** Normal operating mode is automatically resumed

Exits the menu **without opening the selected file.**
Display returns to **Open** menu.

2. Opening a file by entering the name

From previous page



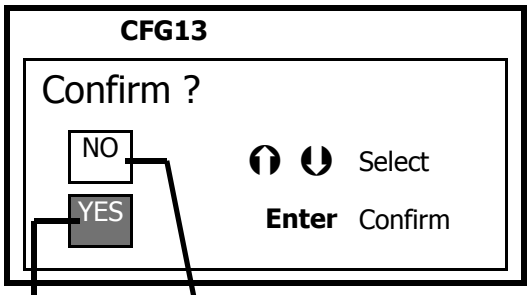
Opening a file
Entering the file name:

The following grid appears on the display.
The letter "A" is highlighted.

NAME:								
A	B	C	D	E	F	G	H	I
J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	0
1	2	3	4	5	6	7	8	9

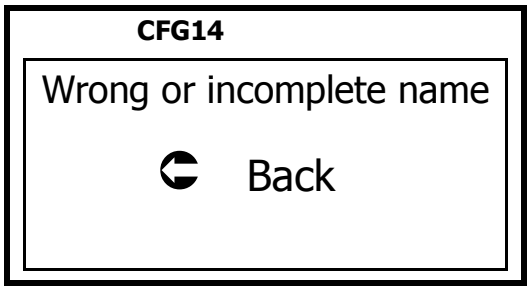
The procedures for entering the file name are those described on page 28.
Refer to "Key Functions" chapter.

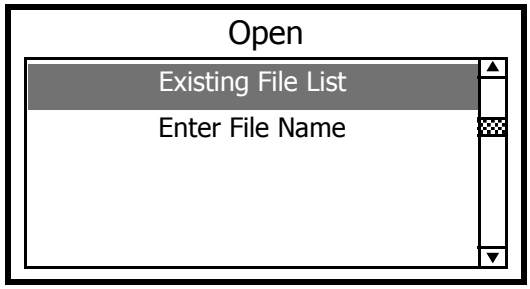
If the name just entered is correct the display shows the following:



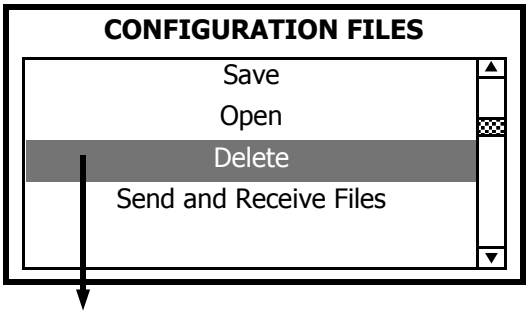
Exits the menu and **opens the file.**
Normal operating mode is automatically resumed

If the name just entered is wrong the display shows the following:





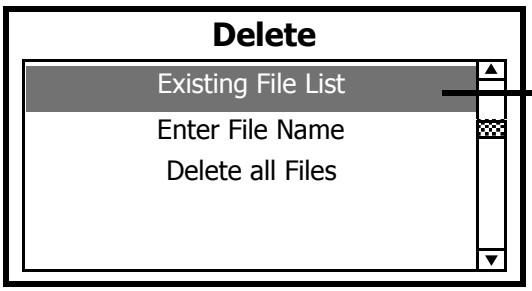
Deleting one of the files

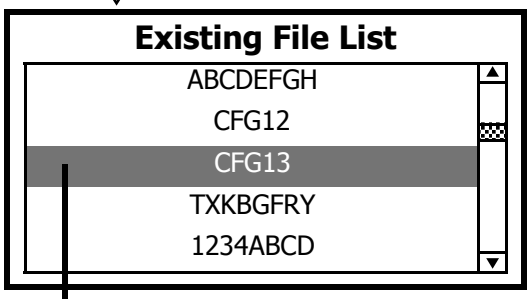


The **Delete** function is used to delete a file in the instrument's memory.
This procedure can be performed in two different ways:

1. **Deleting a file from the existing file list.**
2. **Deleting a file by entering the name.**

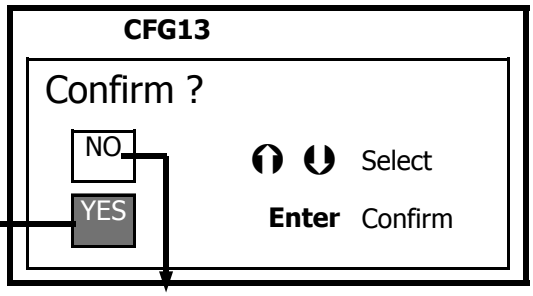
1. Deleting a file from the existing file list





Next Page

The ↑ ↓ keys scroll **UP** and **DOWN** the list of existing files.
The → key **opens** the selected file.
The ← key **quits** the menu step by step until normal operating mode is resumed.

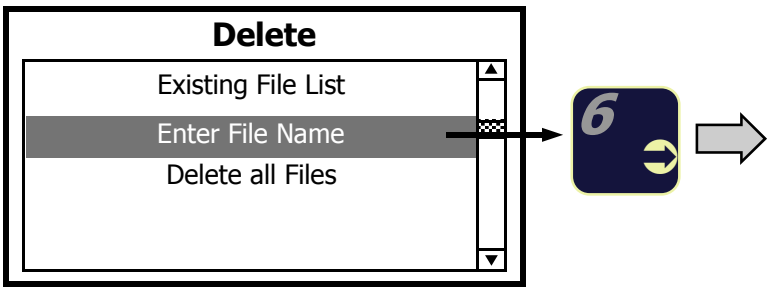


Exits the menu and **deletes the selected file.** Normal operating mode is automatically resumed

Exits the menu **without deleting the selected file.**
Display returns to **Delete** menu.

2. Deleting a file by entering the name

From previous page



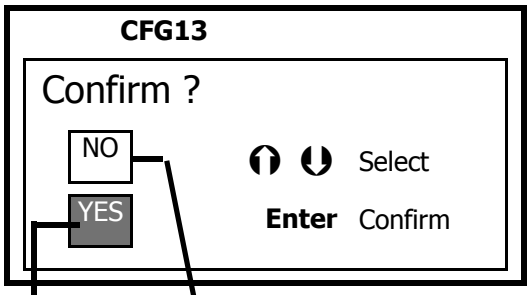
Deleting a file
Entering the file name:

The following grid appears on the display.
The letter "A" is highlighted.

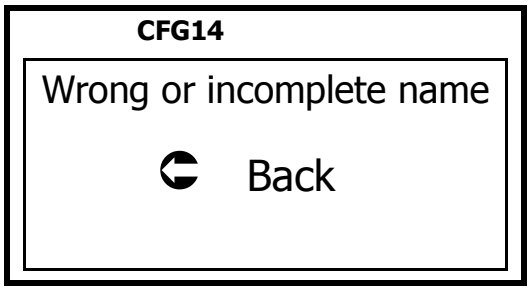
NAME:								
A	B	C	D	E	F	G	H	I
J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	0
1	2	3	4	5	6	7	8	9

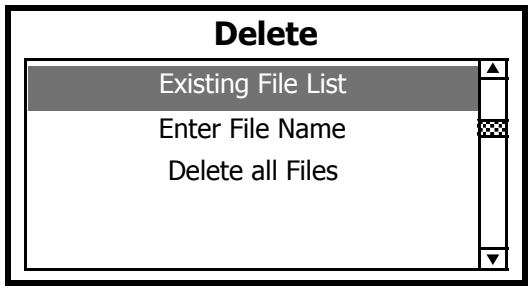
The procedures for entering the file name are those previously described on page 28.
Refer to "Key Functions" chapter.

If the name just entered is correct the display shows the following:



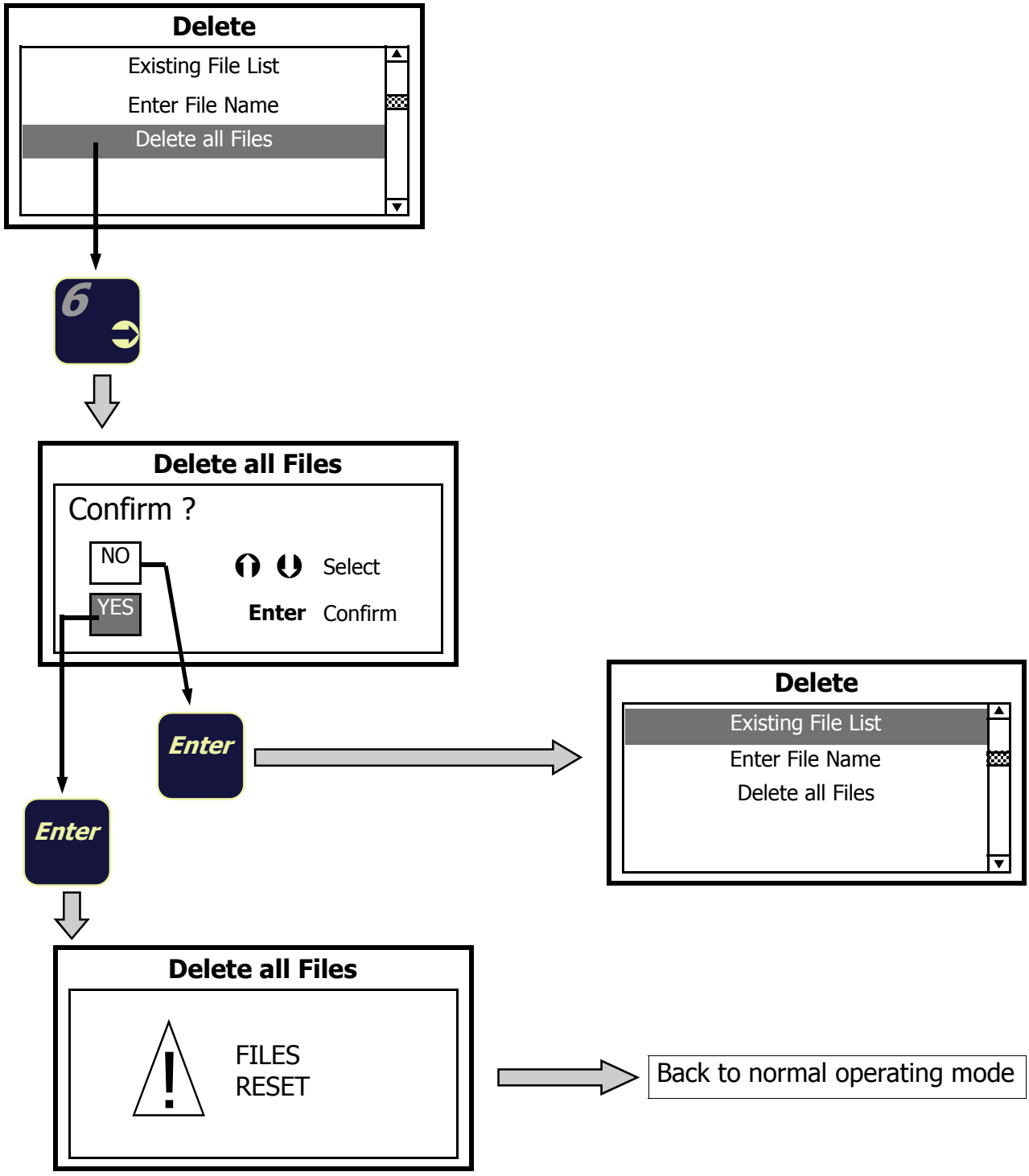
If the name just entered is wrong the display shows the following:





Exits the menu and **deletes the selected file.** Normal operating mode is automatically resumed

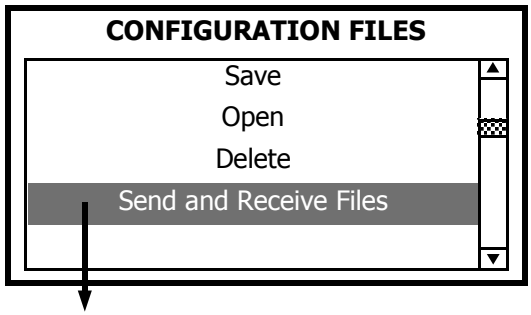
Deleting all the files in the memory



Transferring one file / all files

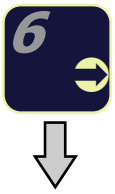
In order to transfer the configuration files to a PC or vice-versa, the following conditions must be satisfied:

1. Assure there is a valid RS-232 connection between the Load Cell Tester and the PC.
2. "Hyper Terminal" application active on the PC, in "Receive File" (from LC Tester to PC) or "Send File" (from PC to LC Tester) mode.
3. Communication parameters: 9600, 8, N, 1.

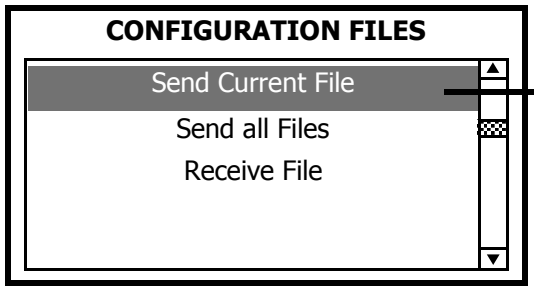


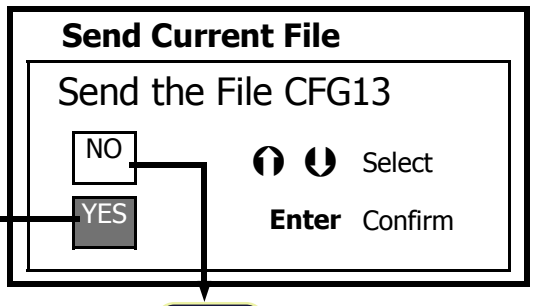
The "Send and Receive Files" function is used to:

1. Send the current file to a computer only (the one currently in use).
2. Send all the files in the LC Tester's memory to a computer (including the one currently in use).
3. Receive from a PC 1 Configuration File.

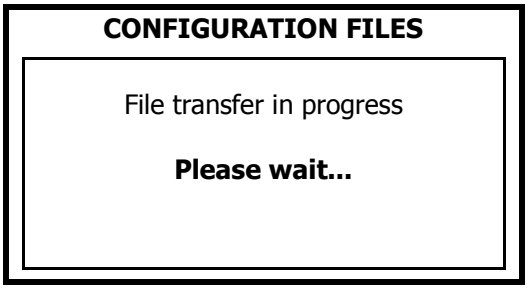


1. Sending the current file to a PC

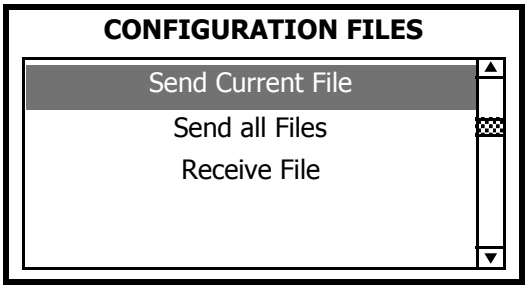




Next page

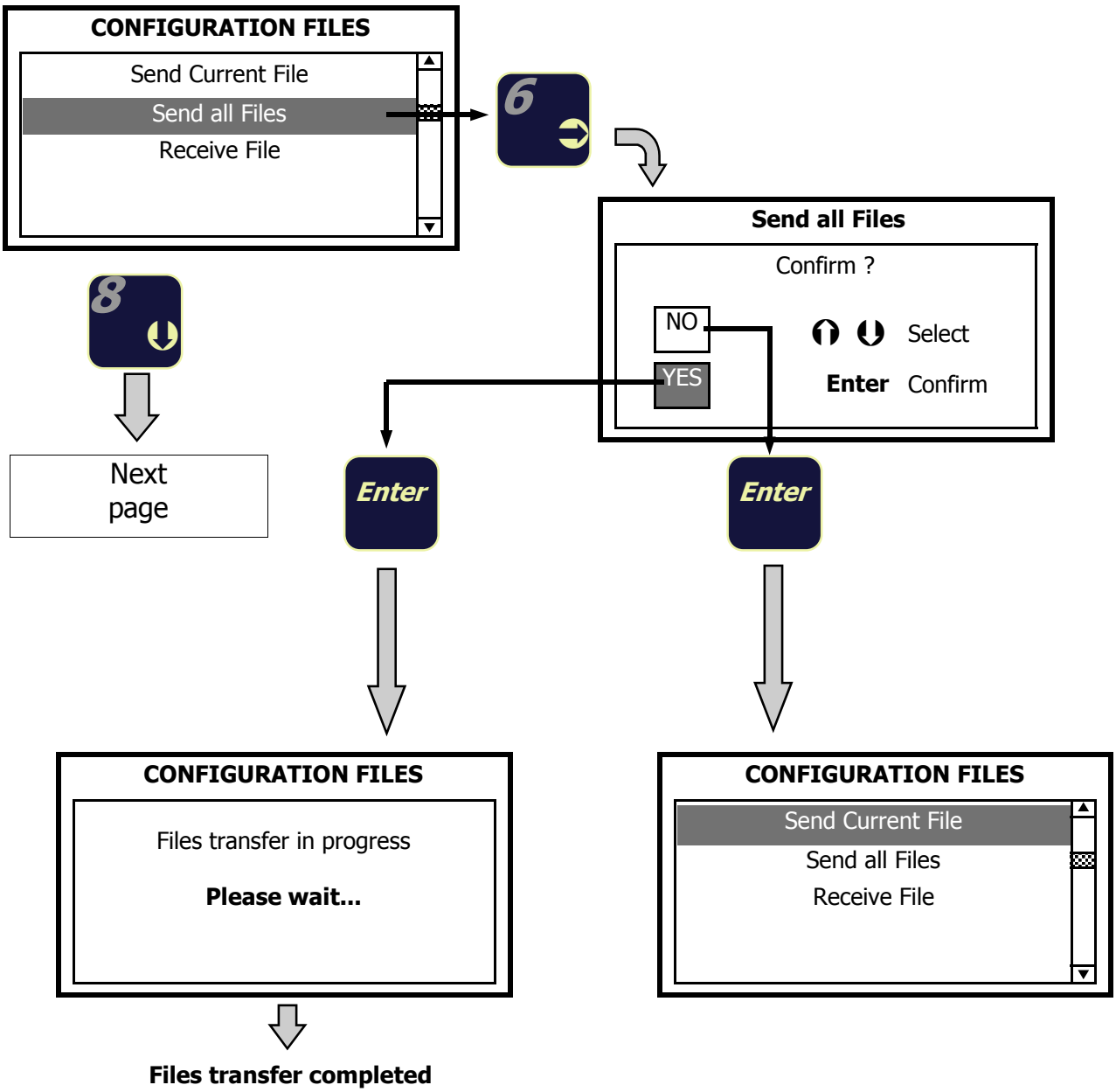


File transfer completed



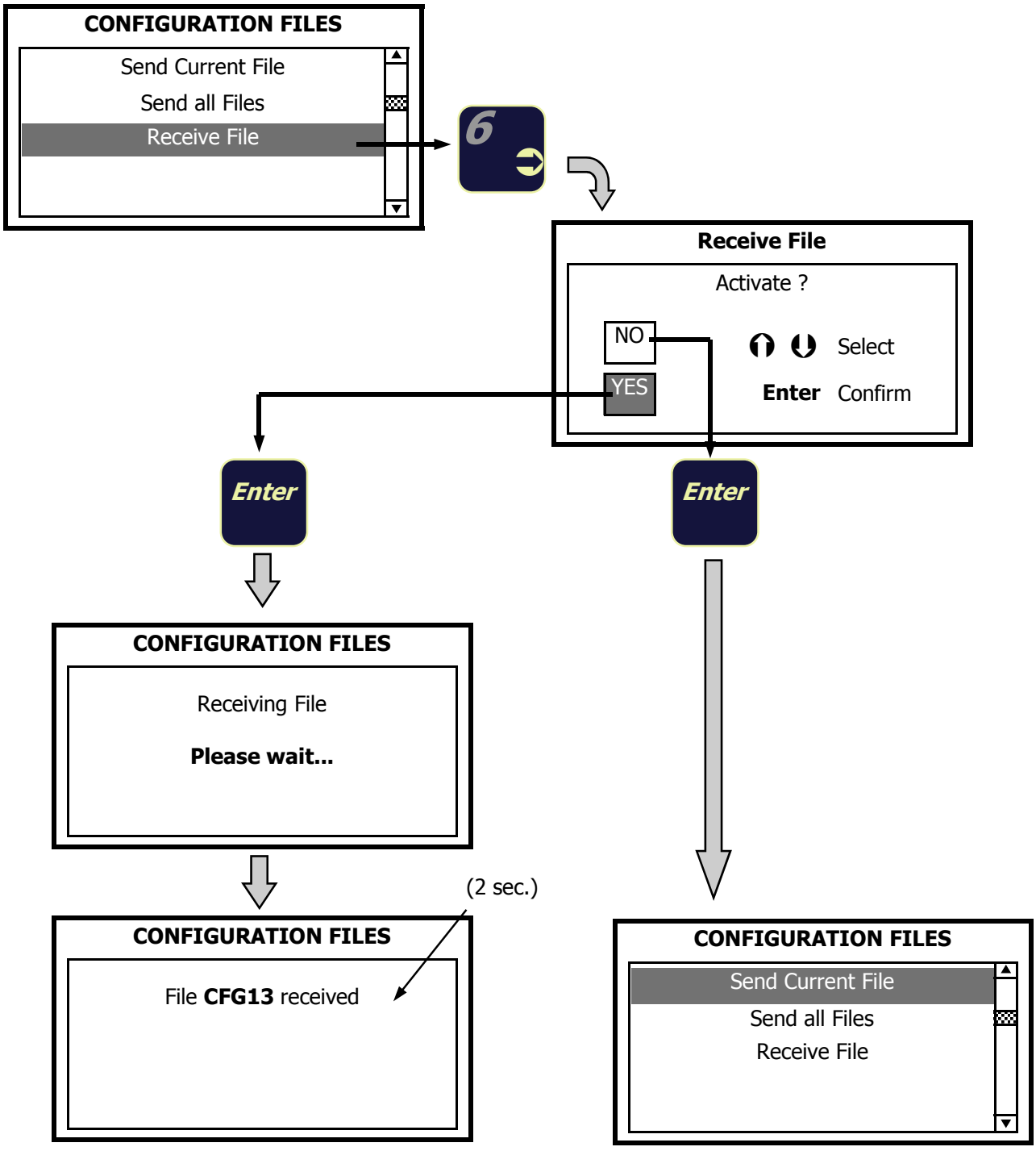
2. Sending all the files to a PC

From previous page



3. Receiving a Configuration File from a PC

From previous page



NOTE:

Receiving a configuration file does not mean to make it operative.
The file just received is added to the list of existing files however, the LC Tester will continue normal operation.

STORING THE mV/V LOAD CELL SIGNALS

This function is used to save the individual zero and span mV/V signals coming from the load cells into the instruments memory.

- Both the **Zero** and **Span** values can be saved (by "Zero" we mean the mV/V values coming from the load cells when the weighing system is unloaded; by "Span" we mean the mV/V values corresponding to a known weight applied on the weighing system).
  The span value may not necessarily coincide with the weighing system's full scale value.

- The mV/V values can only be stored when the instrument is in "Load Cell Tester" mode, and the "mV/V Input Signals" display view is selected (see Figure 1 on page 14).

- **The stored values are automatically associated to the Configuration File currently in use.**

The stored mV/V values can be used as reference values for performing periodic checks on the load cells. When operating the load cell tester in "Calibrator" mode, it can be used to generate a zero and span mV/V output signal (based on the average of the individual signals) that were previously saved in memory. These signals can be used to check or calibrate the Zero and Span of the weighing systems instrumentation.

The mV/V signals representing zero and span can only be saved into the load cell testers memory when:

- The load cell tester is displaying the "mV/V Input Signals" (see Figure 1 on page 14).
- One of the Configuration Files has been opened (see page 30)

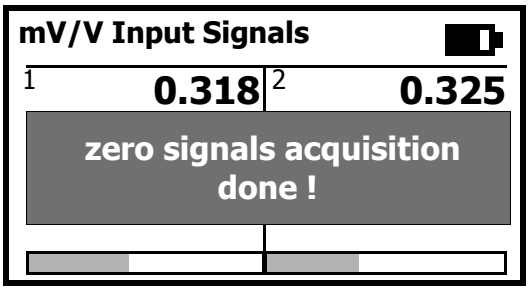
Procedure:

Acquiring the Zero mV/V signals

Make sure that the weighing system is empty or unloaded prior to performing the following operation:

Press and hold the key to save the zero mV/V signals

Once the Zero mV/V signals have been acquired, the following message appears momentarily on the display:



The stored values are automatically associated with the Configuration File currently in use.

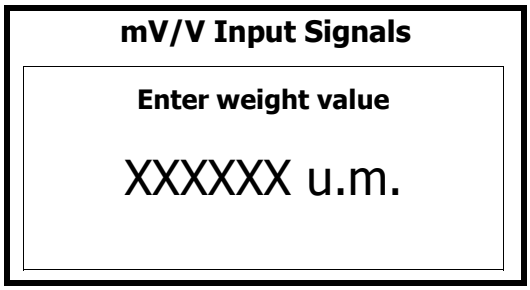
Acquiring the Span mV/V signals

Apply a known weight on the weighing system prior to performing the following operation

Press and hold the

key to save the span mV/V signals

Once the Span mV/V signals have been acquired, the display prompts the following setting:

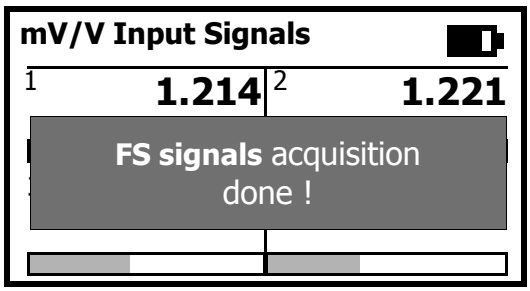


Note: "**u.m.**" = pre-selected Unit of Measurement

Enter the value of the known weight applied on the weighing system.
Refer to page 12 (*Entering numerical data*) for keys functions.

By pressing the

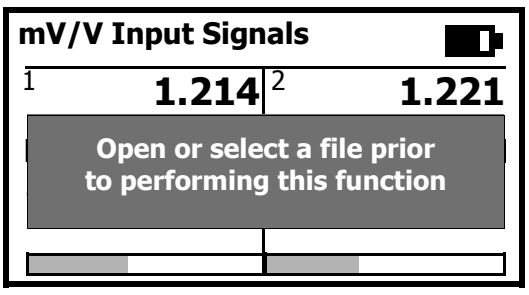
key, the following message appears for a while on the display:



After a while the message disappears automatically and the LC Tester resumes normal operating mode

Warning message during the mV/V signals acquisition

If none of the Configuration Files have been opened previously, the following message will appear on the display when trying to acquire the Zero or Span mV/V signals.

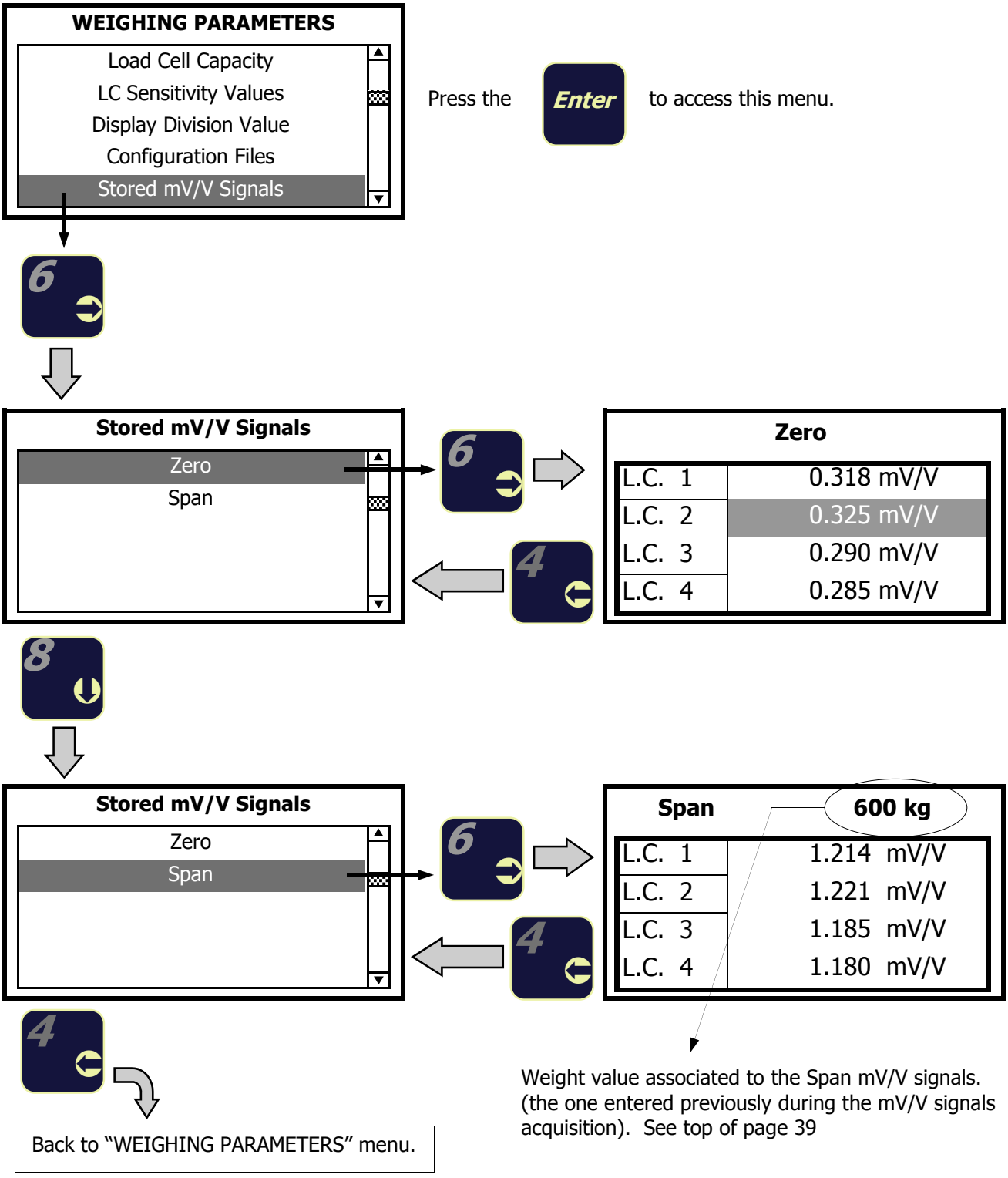


Reading the Zero and Span mV/V signals stored in memory

The user has the opportunity to read the zero and span mV/V values for each system simplifying any periodic checks required on the load cells.

When recalling a Configuration File from memory, the Zero and Span mV/V values previously stored and assigned to the current file, are also recalled.

From "WEIGHING PARAMETERS" menu:



CALIBRATOR mode - GENERATING STORED mV/V LOAD CELL SIGNALS

The stored zero and span mV/V signals can be used to check or calibrate the Zero and Span points of the instrumentation being used in weighing system.

The load cell tester will generate a mV/V signal for zero and span based on the **average** of the individual signals previously stored in memory:

Zero	
L.C. 1	0.318 mV/V
L.C. 2	0.325 mV/V
L.C. 3	0.290 mV/V
L.C. 4	0.285 mV/V

0.318 +
0.325 +
0.290 +
0.285 = 1.218 ÷ 4 = **0.304 mV/V**

In this example **0.304 mV/V** will be the value generated by the LC Tester in order to reproduce the signal coming from the load cells at zero point.

Span	600 kg
L.C. 1	1.214 mV/V
L.C. 2	1.221 mV/V
L.C. 3	1.185 mV/V
L.C. 4	1.180 mV/V

1.214 +
1.221 +
1.185 +
1.180 = 4.800 ÷ 4 = **1.200 mV/V**

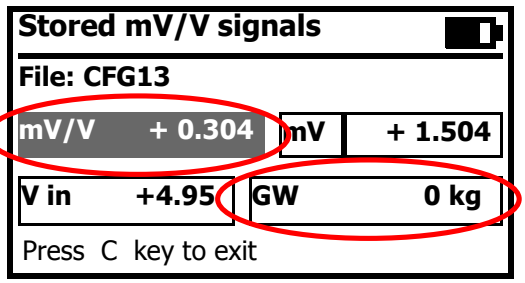
In this example **1.200 mV/V** will be the value generated by the LC Tester in order to reproduce the signal coming from the load cells corresponding to a weight value of **600 kg**.

Procedure:

Press the ***Test/Cal*** button to switch the LC Tester into CALIBRATOR mode

Generating the Zero signal

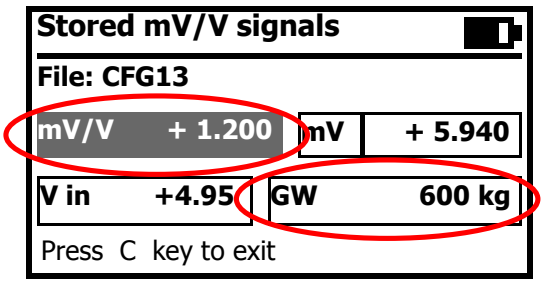
Press and hold



The LC Tester generates 0.304 mV/V.
This signal is used to perform the zero calibration of the weighing indicator.

Generating the Span signal

Press and hold



The LC Tester generates 1.200 mV/V.
This signal is used to perform the span calibration (600 kgs.) of the weighing indicator.

NOTE: In this particular function the LC Tester is able to generate the Zero and Span mV/V values only.
Press the C key in order to resume normal operation in CALIBRATOR mode.

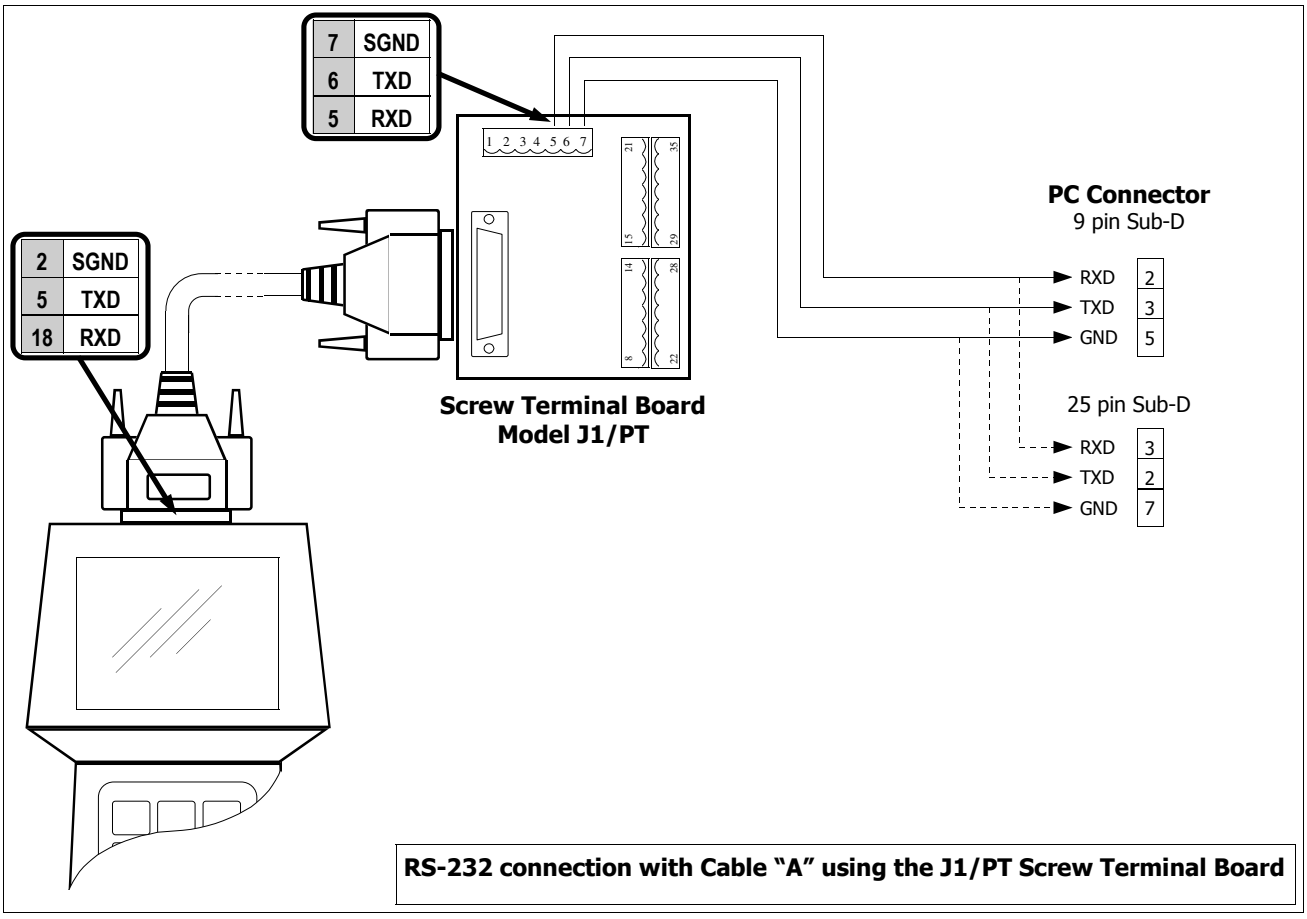
RS-232 CONNECTIONS

The bi-directional RS-232 communication allows transferring the Configuration Files from the load cell tester to a computer and vice-versa.
The female 25 pin Sub-D connector installed on the LC Tester, includes terminals for the RS-232 connection:

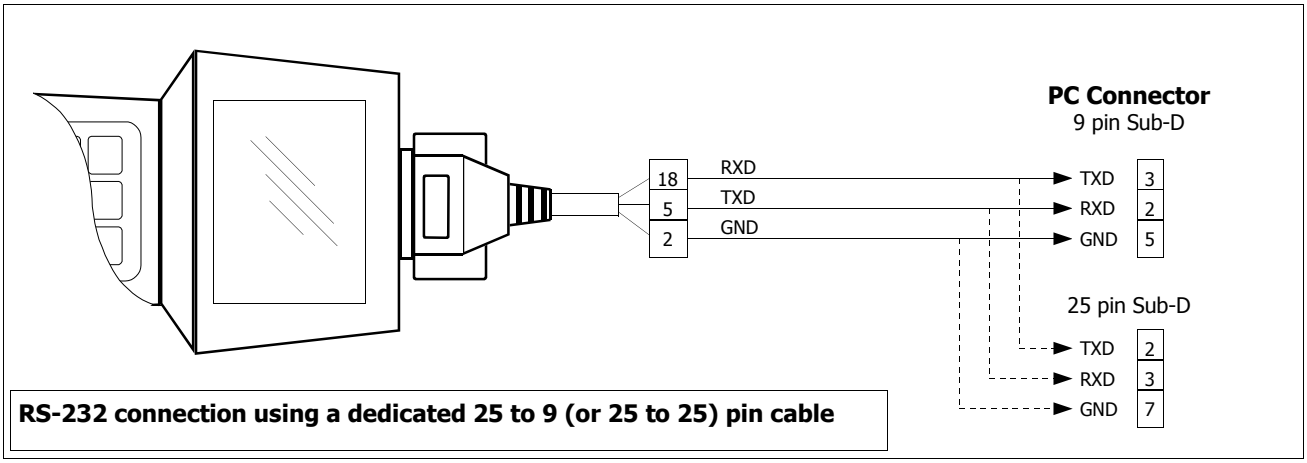
LC Tester 25 pin Sub-D connector pinout

2	GND
5	TXD
18	RXD

The RS-232 connection to the PC can be established using either Cable "A" and the J1/PT Screw Terminal Board (same equipment used for testing the load cells as shown on page 7) or with a dedicated 25 to 9 pin (or 25 to 25) cable (not supplied).



RS-232 connection with Cable "A" using the J1/PT Screw Terminal Board



RS-232 connection using a dedicated 25 to 9 (or 25 to 25) pin cable